



## UNDERWATER FACILITIES

INSPECTION AND ASSESSMENT

AT



# DEPERMING PIER TRIDENT REFIT FACILITY BANGOR, WASHINGTON

FPO-I-84 (I5)

June, 1984

Performed for:

Ocean Engineering and Construction Project Office

Chesapeake Division

Naval Facilities Engineering Command Washington, D.C. 20374

Under:

Contract N62477-84-D-0024-0001

By:

J. Agi & Associates Inc. 1414 Alaskan Way, Suite 600 Seattle, Washington 90101

Project No.: 84-1-2-153

DISTRIBUTION STATEMENT A

Approved for public release; Distribution Unlimited

AD-A168 674

Unclassified	AD-A168 6/4
SECURITY CLASSIFICATION OF THIS PAGE	<u> </u>
REPORT DOCUMENTA	TION PAGE
la. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	<ol> <li>DISTRIBUTION AVAILABILITY OF REP. Approved for public release; distribution is unlimited</li> </ol>
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER Project No: 84-1-2-153	5. MONITORING ORGANIZATION REPORT # FPO-1-84(15)
6a. NAME OF PERFORM. ORG. 6b. OFFICE SYM J. Agi & Associates, Inc.	7a. NAME OF MONITORING ORGANIZATION Ocean Engineering & Construction Project Office CHESNAVFACENGCOM
6c. ADDRESS (City, State, and Zip Code) 1414 Alaskan Way, Suite 600 Seattle, WA 90101	7b. ADDRESS (City, State, and Zip ) BLDG. 212, Washington Navy Yard Washington, D.C. 20374-2121
8a. NAME OF FUNDING ORG. 8b. OFFICE SYM	9. PROCUREMENT INSTRUMENT INDENT # N62477-84-D-0024-0001
8c. ADDRESS (City, State & Zip)	10. SOURCE OF FUNDING NUMBERS PROGRAM PROJECT TASK WORK UNIT ELEMENT # # ACCESS #
11. TITLE (Including Security Classificati Underwater Facilities Inspection and Asses Facility Bangor, Washington 12. PERSONAL AUTHOR(S)	on) sment at Deperming Pier Trident Refit
13a. TYPE OF REPORT 13b. TIME COVERED FROM TO 16. SUPPLEMENTARY NOTATION	14. DATE OF REP. (YYMMDD) 15. PAGES 84-06 77
FIELD GROUP SUB-GROUP Underw	T TERMS (Continue on reverse if nec.) rater inspection, Deperming, Trident Facility Bangor, WA; Bangor, WA
19. ABSTRACT (Continue on reverse if neces The 254 of the total 650 piles in the Magn Pier belong to the Trident Refit Facility Washington not included in the 1980 inspecsubjected to a Level I & Level II inspecti 20. DISTRIBUTION/AVAILABILITY OF ABSTRACT SAME AS RPT.	etic Silencing Facility Deperming at Naval Submarine Base, Bangor, tion FPO-1-80(13) October 1980, were on. The current and previous (Con't) 21. ABSTRACT SECURITY CLASSIFICATION
22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE 22c. OFFICE SYMBOL
DD FORM 1473, 84MAR	202-433-3881 SECURITY CLASSIFICATION OF THIS PAGE

. . . .

BLOCK 19 (Con't)

inspections nave now covered all the piles in the facility except for the recently added dolphins.

In addition to the piles, 30 timber pole troughs which span the space between the finger piers and support the X-loop cables, were also examined and measurements of mudline to bottom of trough were obtained for every other trough.

The overall condition of the examined piles is excellent. Eight piles have sustained minor mechanical damage in the form of ring shakes. In two piles this damage has resulted in marine borer (Bankia) attack, however, at this time the borer damage has not resulted in significant damage to the pile.

It is recommended that the above two piles with mechanical and marine borer damage be encased with plastic wrapping at the zones of damage. The cost of this would be approximately \$5,000.00. The damage found in three piles during the previous inspection has been repaired.

The overall condition of the timber troughs is good. However, extensive marine borer damage was observed in the timber framing members at the pole/bent joint. Also, several timber members restraining the cable assemblies have sustained damage. It is recommended that a comprehensive and detailed inspection be carried out of all these members.

,

4

## EXECUTIVE SUMMARY

The 254 of the total 650 piles in the Magnetic Silencing Facility Deperming Pier belonging to the Trident Refit Facility at Naval Submarine Base, Bangor, Washington not included in the 1980 inspection, FPO-1-80(13) October, 1980, were subjected to a Level I and Level II inspection. The current and previous inspections have now covered all the piles in the facility except for the recently added dolphins.

In addition to the piles, 30 timber pole troughs which span the space between the finger piers and support the X-loop cables, were also examined and measurements of mudline to bottom of trough were obtained for every other trough.

The overall condition of the examined piles is excellent. Eight piles have sustained minor mechanical damage in the form of ring shakes. In two piles this damage has resulted in marine borer (Bankia) attack, however, at this time the borer damage has not resulted in significant damage to the pile.

It is recommended that the above two piles with mechanical and marine borer damage be encased with plastic wrapping at the zones of damage. The cost of this would be approximately \$5,000.00. The damage found in three piles during the previous inspection has been repaired.

The overall condition of the timber troughs is good. However, extensive marine borer damage was observed in the timber framing members at the pole/bent joint. Also several timber members restraining the cable assemblies have sustained damage. It is recommended that a comprehensive and detailed inspection be carried out of all these members. Reywords: Indexage inspection; Washington (Store). A for details on the structure and recommended maintenance, refer to the

for details on the structure and recommended maintenance, refer to the accompanying Executive Summary Table.

QUALITY INSPECTED 3 Availability Codes

Dist Avail a..a/or Special

I

DEPERMING PIER, BANGOR EXECUTIVE SUMMARY TABLE

ESTIMATED TOTAL COST OF REPAIRS FOR PROJECTED DAMAGE	30	00.000,48\$	
ESTIMATED COST OF RECOMMEND.	\$2,500.00	\$2,500.00	\$15,000.00
RECOMMENDATIONS	Encase 1 pile in plastic wrap	Encase 1 pile in plastic wrap	Inspect all cable assembly support timbers.
STRUCTURE TYPE	Timber	Timber Timber Timber	Timber
STRUCTURE	626' x 15'	120' X 30' 710' X 15' 710' X 15'	s) 80' X 2'
TOTAL NO. OF PILES/ NUMBER INSPECTED	128/56	53/16 234/100 235/82	(No. of troughs)
YEAR BUILT	1978	1978 1978 1978	1978
SECTIONS SECTIONS	Access Trestle	Header Pier West Pier East Pier	Trough

# TABLE OF CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY	. 1
EXECUTIVE SUMMARY TABLE	. 11
LIST OF FIGURES AND DRAWINGS	. ۷
LIST OF PHOTOGRAPHS	. VI
LIST OF TABLES	. VIII
SECTION 1 - INTRODUCTION	. 1-1
1.1 CONTRACT	
1.2 CONTRACT NO	. 1-1
1.3 INSPECTION DATE	. 1-1
1.4 CONTRACT DESCRIPTION	. 1-1
1.5 INTRODUCTION TO PROJECT	. 1-2
1.6 DEFINITIONS: LEVEL I, II AND III INSPECTIONS	. 1-2
SECTION 2 - ACTIVITY DESCRIPTION	. 2-1
2.1 NAME OF ACTIVITY	. 2-1
2.2 LOCATION OF ACTIVITY	. 2-1
2.3 DESCRIPTION OF ACTIVITY	. 2-1
SECTION 3 - INSPECTION PROCEDURE	. 3-1
3.1 LEVEL OF INSPECTION	. 3-1
3.2 INSPECTION PATTERN/SCOPE OF WORK	. 3-1
3.3 INSPECTION PROCEDURE	. 3-2
3.3.1 EQUIPMENT,	. 3-2
SECTION 4 - FACILITY INSPECTED	. 4-1
4.1 FACILITY INSPECTED	. 4-1
A 2 EACTLITY DESCRIPTION	1.6

# TABLE OF CONTENTS (Cont'd)

		Page
4.3	OBSERVED INSPECTED CONDITION	4-12
	4.3.1 PILES	4-12
	4.3.2 X-LOOP TROUGHS	4-12
	4.3.3 MISJELLANEOUS	4-13
4.4	STRUCTURAL CONDITION ASSESSMENT	4-19
4.5	RECOMMENDATIONS	4-20
TABLES		T-1 to T-29
APPENDICES - A.A	ENVIRONMENTAL DATA	A-1
в.А	INSPECTION PROCEDURE	A-7
	B.A.a BACKGROUND ON INSTRUMENTATION AND METHODS	A-7
	B.A.b REASONS FOR SELECTION OF PARTICULAR INSTRUMENTATION	A-8
В.В	PERSONNEL ON PROJECT	A-9
B.C	TIME OF PROJECT	A-12
B.D	EXIT BRIEFING	A-12

## LIST OF FIGURES AND DRAWINGS

FIGURE		<u>Page</u>
1	TRIDENT SUPPORT SITE - PUGET SOUND AREA	A-4
2	TRIDENT SUPPORT SITE - KITSAP COUNTY	A-5
3	TRIDENT SUPPORT SITE - GENERAL PLAN	A-6
4	MARINE GROWTH PROFILE	4-2
Drawing		
1	PLAN SHOWING LOCATION AND CONDITION OF INSPECTED PILES	4-8
2	PLAN SHOWING TYPICAL SECTIONS AND SITE PLAN	4-9
3	PROFILES SHOWING DISTANCE FROM UNDERSIDE OF X-LOOP SUPPORT POLES TO MUDLINE	4-18

## LIST OF PHOTOGRAPHS

Photograph		Page
1	TYPICAL MUSSEL AND BARNACLE FOULING FOUND IN THE INTERTIDAL ZONE	4-3
2	TYPICAL FOULING IN THE LOWER INTERTIDAL ZONE	4-3
3	MARINE FOULING, TUBEWORMS, SEA ANEMONES, BARNACLES AND HYDROIDS FOUND IN THE UPPER IMMERSED ZONE	4-4
4	DENSE SMALL BARNACLES AND SEA ANEMONES FOUND IN THE LOWER IMMERSED ZONE	4-4
5	DENSE SMALL BARNACLE GROWTH AND OCCASIONAL SEA ANEMONES FOUND ON PILES IN VICINITY OF MUDLINE	4-5
6	OVERVIEW OF THE DEPERMING PIER AT THE MAGNETIC SILENCING FACILITY, BANGOR, WASHINGTON	4-10
7	EAST AND WEST PIERS OF THE DEPERMING PIER - LOOKING SOUTH TOWARDS HEADER PIER	4-10
8	TYPICAL TIMBER BRACE FRAMING OF PILING IN THE DEPERMING PIER	4-11
9	PILE DOLPHINS ADDED TO OUTSIDE (NORTH) END OF FINGER PIERS	4-11
10	PILE 60-1W OF WEST PIER. 2% MECHANICAL SHAKE AND BANKIA ATTACK	4-14
11	CLOSE-UP OF PILE 60-1W SHOWING BANKIA ENTRANCE HOLES (TUNNELS)	4-14
12	X-LOOP TROUGH. NOTE MINIMAL FOULING GROWTH ON X-LOOP CABLES RUNNING THROUGH TROUGH	4-15
13	X-LOOP TROUGH FRAMING TIMBER. NOTE HEAVY MARINE BORER DAMAGE TO CUT-OFF END	4-15
14	DIAGONAL TIMBER BRACE WITH FOULING ORGANISMS REMOVED TO SHOW INCIPIENT LIMNORIA ATTACK	4-16
15	EXTENSIVE MARINE GROWTH IN THE INTERTIDAL ZONE ON CABLE ASSEMBLY BUNDLES	4-16
16	CABLE SUPPORT/RESTRAINING TIMBERS AT BENT 40 OF EAST PIER. NOTE EXTENSIVE BANKIA DAMAGE	4-17

# LIST OF PHOTOGRAPHS (Cont'd)

Photograph		Page
17	SAMPLE OF CABLE SUPPORT TIMBER SHOWING DESTRUCTION BY THE INTERNAL MARINE BORER, BANKIA	4-17
18	THE SURFACE UNIT MONITORED BY TECHNICIAN. THE METER PROVIDES A CONTINUOUS CROSS-SECTIONAL AREA READOUT ALSO TWO WAY TELEPHONE CONTACT BETWEEN DIVER AND SURFACE	A-10
19	THE ULTRASCAN PTM-4, THE UNDERWATER SONIC PROBE UNIT USED TO SCAN PILES AND LOCATE INTERNAL DAMAGE. PROBE IS MANIPULATED BY DIVER	A-10
20	CREOSOTE TREATED PILE SECTION WITH VIRTUALLY NO EVIDENCE OF INTERNAL DAMAGE SHOWS THE DIFFICULTY OF PROVIDING QUANTITATIVE STRUCTURAL DATA WITH VISUAL INSPECTION	A-11
21	SAME PILE CUT TO SHOW EXTENSIVE INTERNAL TEREDINE DAMAGE	A-11

## LIST OF TABLES

Table		Page
	LEGEND TO TABLES	T-1
1	REMAINING CROSS-SECTIONAL AREA AND DESCRIPTION OF DAMAGE TO INDIVIDUAL PILING	T-2
2	NUMERICAL AND PERCENTAGE DISTRIBUTION OF DAMAGE	T-7
3	COLUMN LOAD CAPACITY CALCULATIONS 1984 INSPECTION	T-8
4	COLUMN LOAD CAPACITY CALCULATIONS 1980	T-19

## SECTION 1 - INTRODUCTION

## 1.1 CONTRACT

Department of the Navy
Chesapeake Division, Naval Facilities Engineering Command
Building 212
Washington Navy Yard, Washington, B.C. 20374

## 1.2 CONTRACT NO. N62477-84-D-0024

# 1.3 INSPECTION DATE 4 June, 1984 (week of)

#### 1.4 CONTRACT DESCRIPTION

The contractor shall provide all required engineering services necessary for underwater assessment of various Navy waterfront facilities as directed by the officer in charge and as specifically described in individual orders. The initial award under this contract is for the assessment of the structural condition of 254 timber piles not included in the previous inspection carried out in 1980 (N62477-81-C-0265) on the Magnetic Silencing Facility belonging to the Trident Refit Facility at the Naval Submarine Base, Bangor, Washington. These piles shall receive a Level I and a Level III inspection. In addition, a Level I general inspection shall be conducted on all of the cable support timber troughs within the open structure between the finger piers. Also, measurements will be obtained from the underside of the trough to the mudline on every other bent.

#### 1.5 INTRODUCTION TO PROJECT

This report is prepared under the Underwater Inspection Program conducted by the Ocean Engineering Project Office (FPO-1), Chesapeake Division, Naval Facilities Engineering Command as part of NAVFAC's Specialized Inspection Program. This is a task oriented engineering service program in support of inspection, analysis and design of repairs of the submerged portions of Navy Waterfront Facilities.

This report covers the inspection carried out on the Deperming Pier at the Magnetic Silencing Facility, Naval Submarine Base, Bangor, Washington. The purpose of the underwater assessment is to provide a generalized structural condition and repair requirements report on the designated facilities within the activity.

A description of the facility, it's location and mission is provided. Detailed results with respect to individual piling, troughs and overall assessment of structural condition and recommendations are also given.

#### 1.6 DEFINITIONS: LEVEL 1, II AND III INSPECTIONS

The following levels of inspection are to be construed only as general guidelines and not specific task procedures. Within the description of any specific task, the level and complexity required in an inspection will probably be a blend or combination of the different levels of inspection. Specific task descriptions will use these definitions as a reference.

Level I: General Inspection: This type of inspection is essentially a "swim-by" overview, which does not involve cleaning of any structural elements, and can therefore be conducted much more rapidly than the other levels of inspection.

The level I inspections should confirm as-built structural plans and detect obvious major damage or deterioration due

to overstress (ship impact, ice), severe corrosion, or extensive biological growth and attack. The underwater inspector shall rely primarily on visual and/or tactile observations (depending on water clarity) to make condition assessments. These observations are normally made over the specified exterior surface area of the underwater structure whether it is a quaywall, bulkhead, seawall, pile, or mooring. Visual documentation (utilizing underwater television and/or photography), may be included with the quantity and quality adequate for documentation of the findings which will be representative of the facility condition.

Level II: Detailed Inspection: This type of inspection is directed toward detecting and describing damaged/deteriorated areas which may be hidden by surface biofouling or deterioration and toward obtaining a limited amount of deterioration measurements. These data should be sufficient to enable gross estimates to be made of facility load capability. Level II inspection will often require cleaning or structural elements. Since cleaning is time consuming it is generally restricted to areas that are critical or which may be representative of the entire structure itself. The amount and thoroughness of cleaning to be performed is governed by what is necessary to discern the general condition of the overall facility. Simple instruments such as calipers, measuring scales, and ice picks are commonly used to take physical measurements. However, a small percentage of more accurate measurements may also be taken with more sophisticated instruments for several reasons. These measurements will validate large numbers of simple measurements and in some hard-tomeasure areas will actually be easier and faster to obtain. Where the visual scrutiny, cleaning, and/or simple measurements reveal extensive, deterioration, a small sampling of detailed measurements will enable gross estimates to be made of the structure's integrity. For example, on extensively corroded steel H-piles a small percentage should receive ultrasonic thickness measurements to determine typical cross-section profiles. The cross-sections determined by these spot checks would be used to determine individual H-pile load capability which would then be extrapolated to obtain a "ballpark" estimate of overall facility load capability. Visual documentation (utilizing underwater television and/or photography) should be included with the quantity and quality adequate to be representative of the range of facility damage/deterioration.

LEVEL III: Highly Detailed Inspection: This type of inspection will often require the use of Non-Destructive Testing (NDT) Techniques, but may also require the use of partially destructive techniques such as sample coring thorough concrete and wood structures, physical material sampling, or in-situ surface hardness testing. The purpose of this type of inspection is to detect hidden or interior damage, loss in cross-sectional area, and material homogeneity. A Level III insepction will usually require prior cleaning. The use of NDT techniques are generally limited to key structural areas, areas that may be suspect or to structural members which may be representative of the underwater structure. Visual documentation (utilizing underwater television and or photography) and a sampling of physical measurements should be included with quantity adequate for documentation of the findings which will be representative of the facility

condition.

#### SECTION 2 - ACTIVITY DESCRIPTION

#### 2.1 NAME OF ACTIVITY

Trident Refit Facility, Bangor, Washington

## 2.2 LOCATION OF ACTIVITY

The Trident Refit Facility is located at the Naval Submarine Base on Kitsap Peninsula in Puget Sound, due west of Seattle, Washington. The site is rural in nature and the nearest urban areas are Silverdale, Poulsbo and Keyport, with approximate populations of 1,000, 1,700 and 500 respectively. The Greater Seattle Metropolitan area with a population of approximately 500,000 is about one hour east by ferry and highway. Bremerton, site of the existing Naval Shipyard, is located 13 miles south of the Bangor Annex. The Naval Torpedo Station, Keyport, is located four miles east of the Submarine Base.

#### 2.3 DESCRIPTION OF ACTIVITY

This activity maintains waterfront facilities which provide the interface between the submarines and the shore support activity. The task under the current contract covers only the Magnetic Silencing Facility Deperming Pier.

The Deperming/Degaussing area provides the facilities to detect and remove the magnetic forces in the submarine. The facility consists of two principal components, the Deperming Pier and the Degaussing Range. The Deperming Pier is a non-magnetic wood pile pier adequate in size to berth a TRIDENT submarine and is equipped to remove magnetic forces which develop in the submarine. This project was carried out to inspect the wood marine piles, from mudline to cap, and to establish the "as built" base line conditions of the facility.

#### SECTION 3 - INSPECTION PROCEDURE

An underwater inspection and nondestructive testing was carried out of in-place timber piles and timbers of the cable assembly support troughs in the Deperming Pier of the Magnetic Silencing Facility, Naval Submarine Base, Bangor, Washington, during the week of June 4, 1984.

## 3.1 LEVEL OF INSPECTION

A Level I and III inspection was carried out of timber piles as specified under Task 1 of this contract. A Level I general inspection was carried out of the troughs supporting the cables in the bay between the east and west finger piers.

#### 3.2 INSPECTION PATTERN/SCOPE OF WORK

A Level I general inspection and Level III ultrasonic testing was carried out on the 254 piles not included in the previous inspection carried out in 1980 Underwater Inspection Report Number FPO-1-80-(13), October, 1980. This includes piles in the approachway trestle, the header pier and the east and west finger piers. This report and the previous report cover all piles in the Deperming Pier. The current piling plans and Tables 1, 3 and 4 show results from both projects. (Tables are in Appendix)

In addition to the piles a Level I inspection was carried out of the 30 X-loop cable troughs extending between the finger piers. These troughs consist of two treated (approx. 14-16" diameter) timber poles each with timber cross members on the under side. The poles are attached to structural piles in the east and west finger piers.

In addition to the inspection, measurements were obtained from the underside of the troughs to the mudline on every other trough.

## 3.3 INSPECTION PROCEDURE

## 3.3.1 Equipment

- B.C. Research ULTRASCAN PTM-4\*, pile testing instruments.
- Underwater telephone.
- Nikonos II Camera with Metz GN41 Strone in Underwater Housing.
- Calipers
- Miscellaneous ancillary equipment and SCUBA equipment.
- See Photographs 1 and 2 for ULTRASCAN PTM-4 instruments, in appendices.

<sup>\*</sup> Patented

#### SECTION 4 - FACILITY INSPECTED

#### 4.1 FACILITY INSPECTED

Deperming Pier, Magnetic Silencing Facility (MSF), Naval Submarine Base, Bangor, Washington.

The results of this inspection are detailed in this section of the report. The discussion of the facility is presented in four sections: (1) A description of the overall facility and its operations as well as a specific detailing of the construction and identification of the examined piles; (2) A detailing of the observed condition of the facility as determined by the field inspection; (3) A quantitative assessment of the structural condition of the facility based on the observed condition; and (4) Recommendations for maintenance to ensure the structural integrity of the facility. Tables detailing the condition of the inspected piles as well as cost breakdowns for any necessary repairs are included in the accompanying appendices.

Water depths ranged up to 65 feet at the north end of the finger piers. Underwater visibility during the inspection ranged from two to five feet.

Extensive marine fouling growth was found throughout the inter-tidal and immersed zones with observed significant increase in growth since the 1980 inspection. Specifically the fouling growth pattern was as follows:

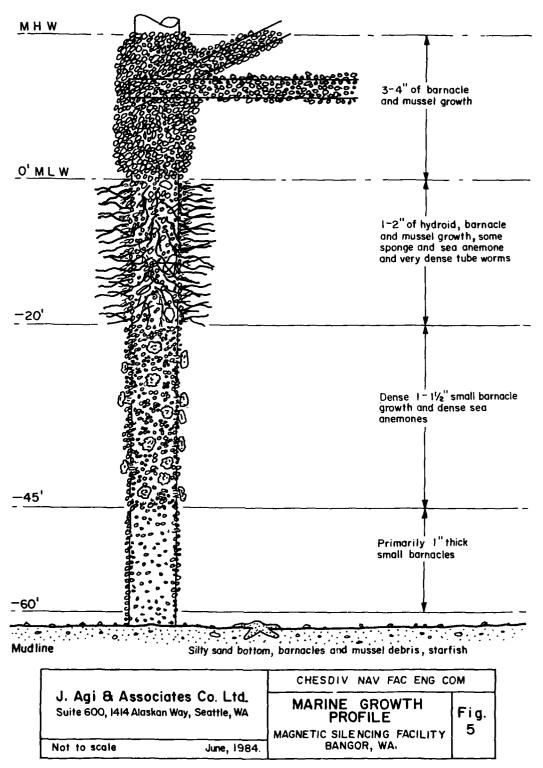
Inter-Tidal zone - Dense barnacle and mussel growth.
 Upper immersed zone - Primarily dense tubeworms also
 (0' to -20') hydroids, barnacles, mussels,

sea anemones and sponges.

Lower immersed zone - Dense,  $1'' - 1_2'''$ , barnacle growth (-20' to -45') and dense sea anemones.

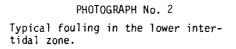
Mudline - Primarily dense barnacle cover.

The following Figure 4 and Photograph Not.1 to 5 illustrate the typical conditions found.





PHOTOGRAPH No. 1
Typical mussel and barnacle fouling found in the intertidal zone.







 $$\operatorname{PHOTOGRAPH}$  No. 3 Marine fouling, tubeworms, sea anemones, barnacles and hydroids found in the upper immersed zone.



PHOTOGRAPH No. 4

Dense small barnacles and sea anemones found in the lower immersed zone.



 $\label{eq:photograph} PHOTOGRAPH \ \mbox{No.} \ 5$  Dense small barnacle growth and occasional sea anemones found on piles in vicinity of mudline.

## 4.2 FACILITY DESCRIPTION

The Magnetic Silencing Facility is located at the extreme north end of the Naval Submarine Base, Bangor. The structure extends out approximately 700 feet perpendicular to the shore. A 567 foot long by 15 foot wide Access Trestle joins a Header Pier and the 730 foot by 15 foot East and 745 by 15 foot West Piers. The entire structure is constructed of treated Douglas Fir piles in accordance with ASTM D25 specifications. The pile bents in the Access Trestle are composed of four and six piles each. The bents are numbered one through 29.5 from the shore and the pile rows are designated by consecutive numbers from the east. The Header Pier runs from Bent 30 to Bent 36.5 and the piles are designated by consecutive numbers from the "inside" of the pier. The West Pier runs from Bent 37W to 77W and the East Pier extends from Bent 30E to Bent 77E. In both piers the piles are numbered from the outside towards the center line of the pier. See the accompanying piling plans (Dwg.No.1) for overall layout and pile numbering.

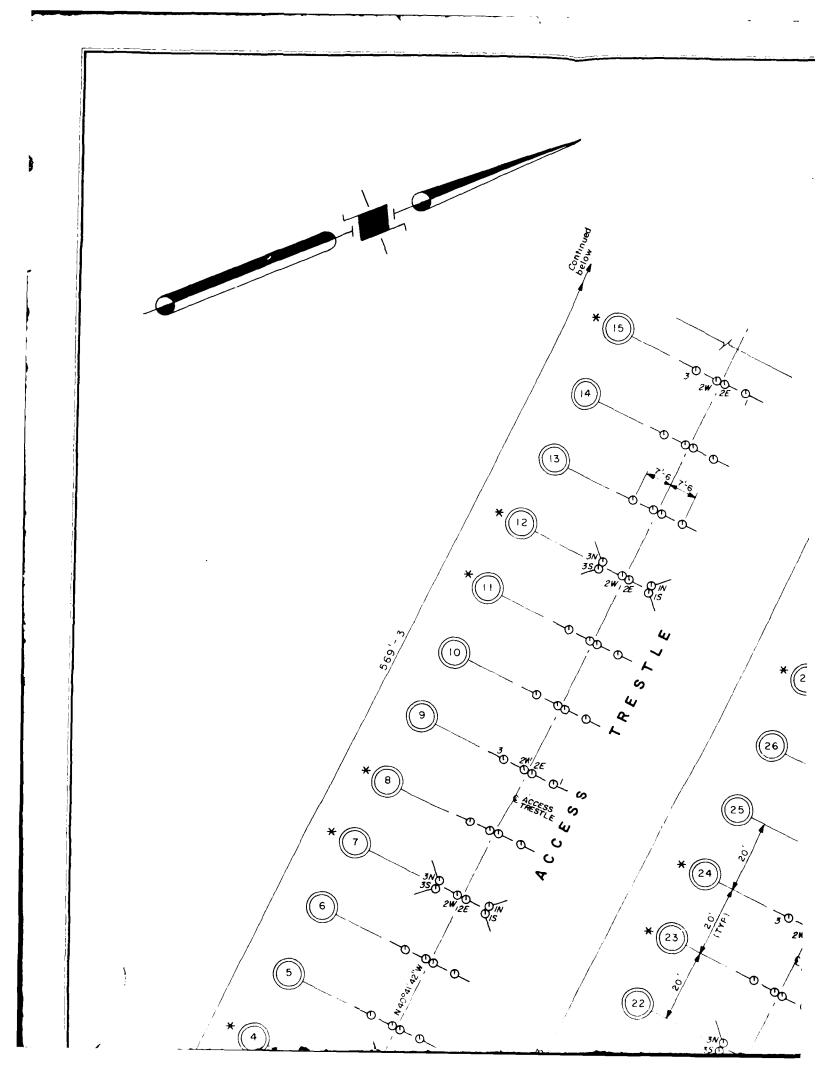
Extensive timber bracing extends down 12 feet from the pile tops. The Commercial Grade, No. 2, Douglas Fir-Larch bracing extends both with the rows and bents. (See Photograph 1.)

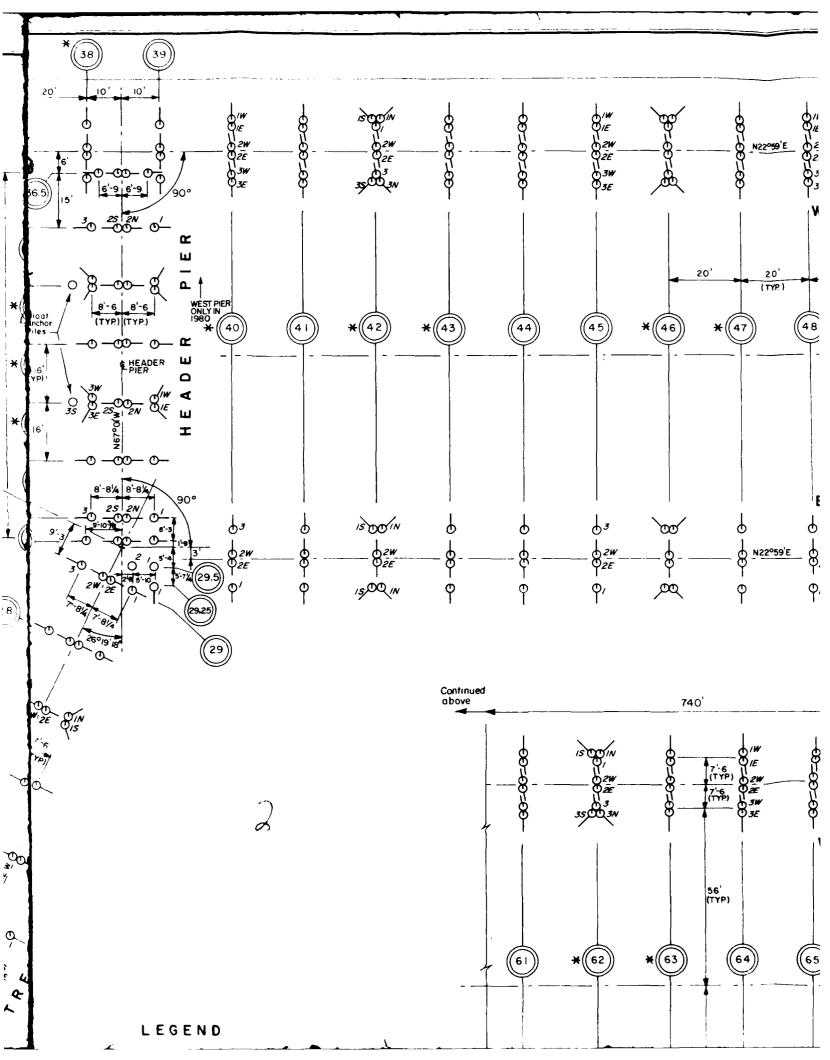
The mudline to cap pile lengths range from 35 feet in the approach to 75 feet in the piers. Mean pile diameter in the Access Trestle ranged from 11" to 15". The pile butt diameters ranged from 16" to 19" with the average being about 17". Pile lengths and diameters for the individual piles are given in Table 1. (See Appendix.)

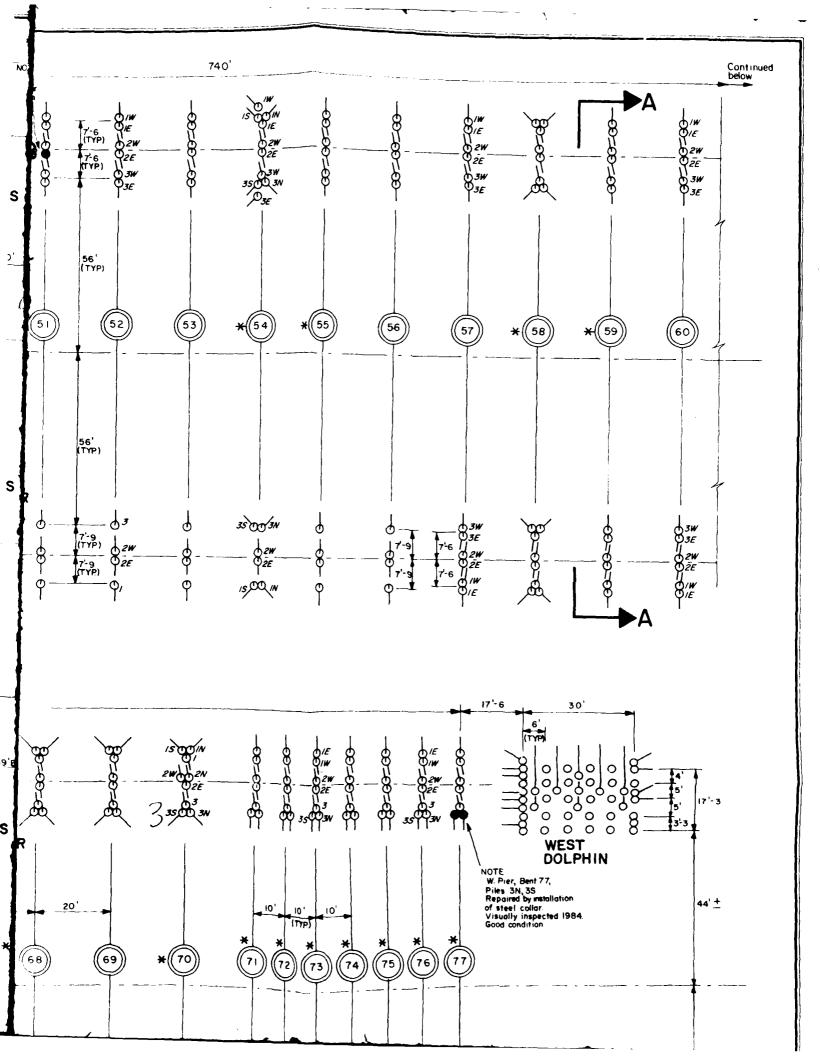
Maximum water depth encountered was approximately 65 feet (at MHW) at the north end of the East and West Piers. Underwater visibility ranged from two to five feet with some suspension turbidity encountered throughout the facility.

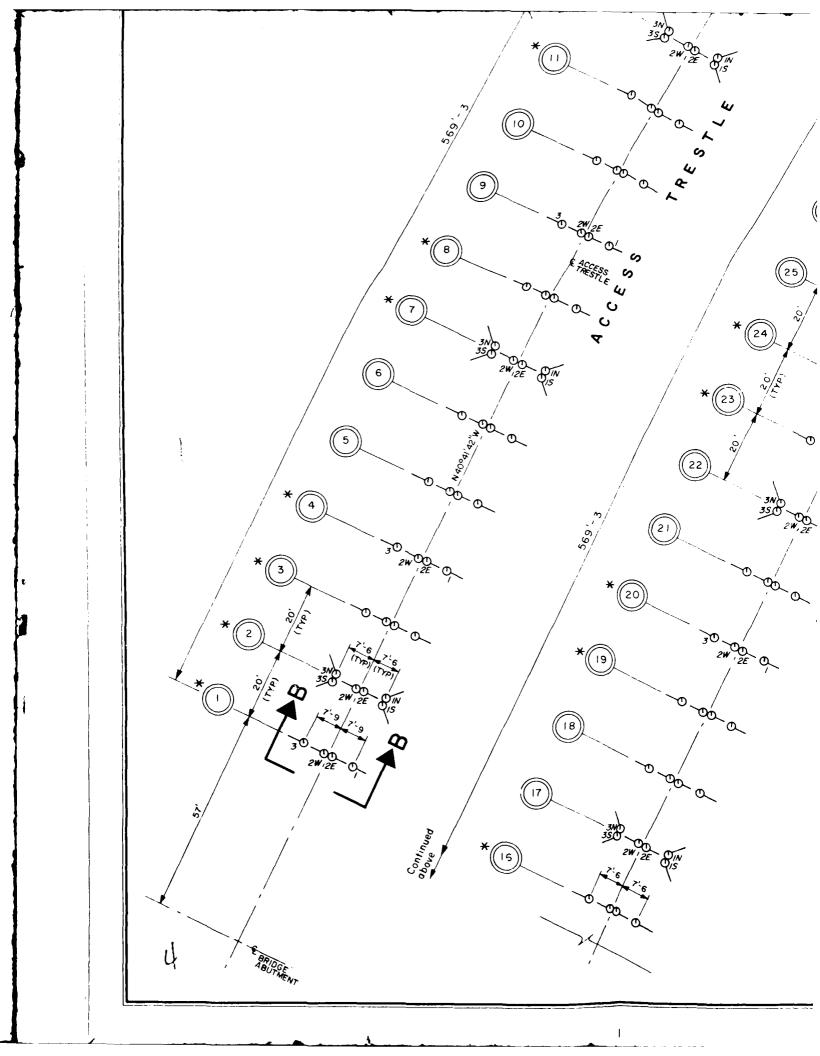
The two main piers, east and west, support the deperming mechanism. Above water this consists of cables extending between the piers supported by 50 foot poles on each pier. Underwater the cables are supported by troughs constructed of timber poles and cross-timbers. The cables rest inside these troughs with the troughs being attached to finger pier bents by timber framing. The troughs run above the mudline from 0' to -10'. Elevations of mudline/troughs are enclosed.

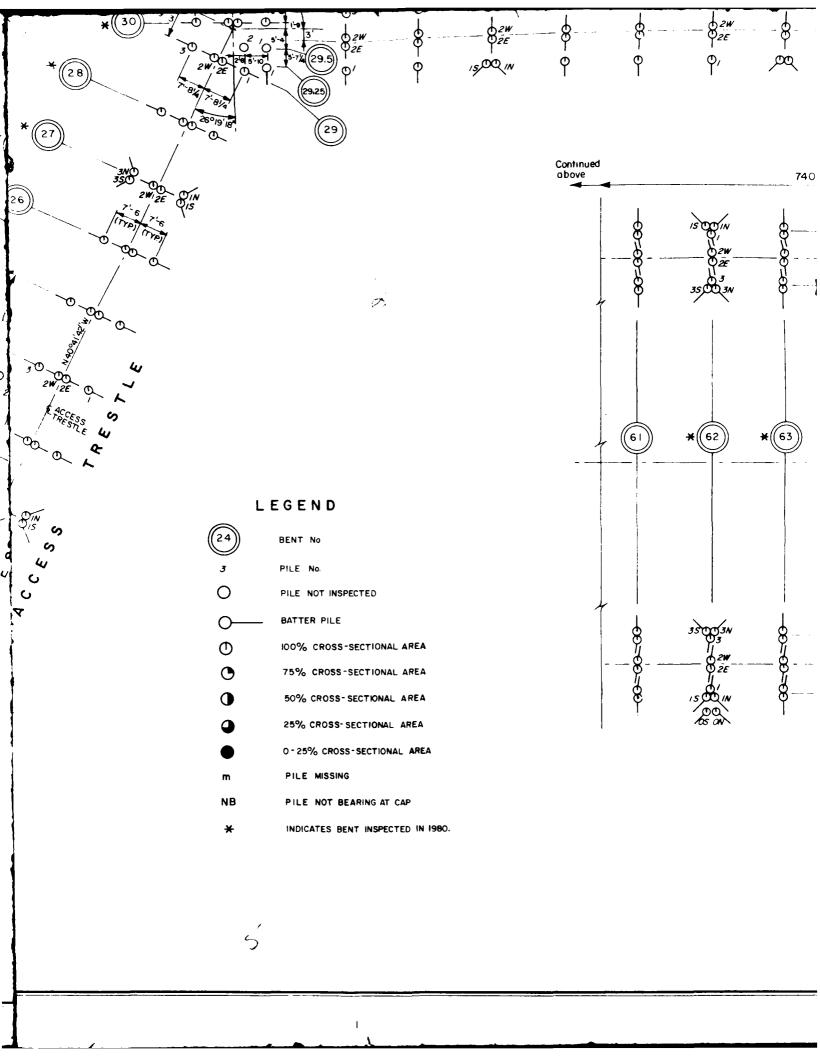
Construction of the facility was completed in 1978. Approximately two years ago pile dolphins were added to the outside ends of the finger piers. See the accompanying Drawings 1, 2 and 3 which are based on NAVFAC Drawings numbered 6045178, 6045179, 6045180, 6045186, 6045217, 6144576, for detailed layout. The accompanying photographs also illustrate various features of the facility.

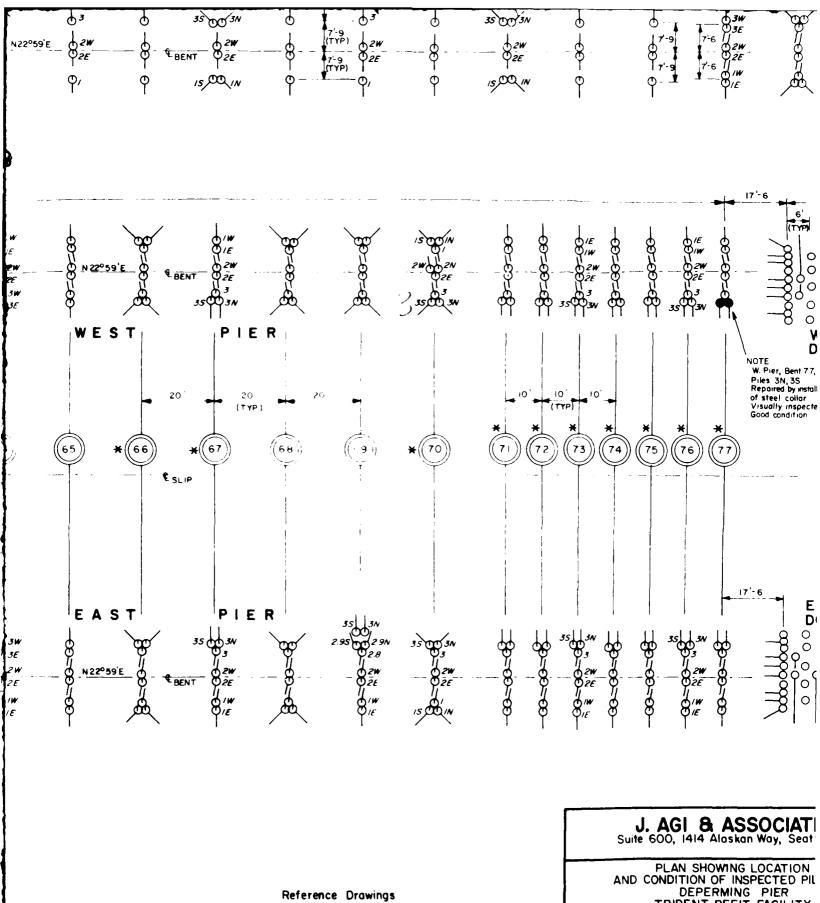








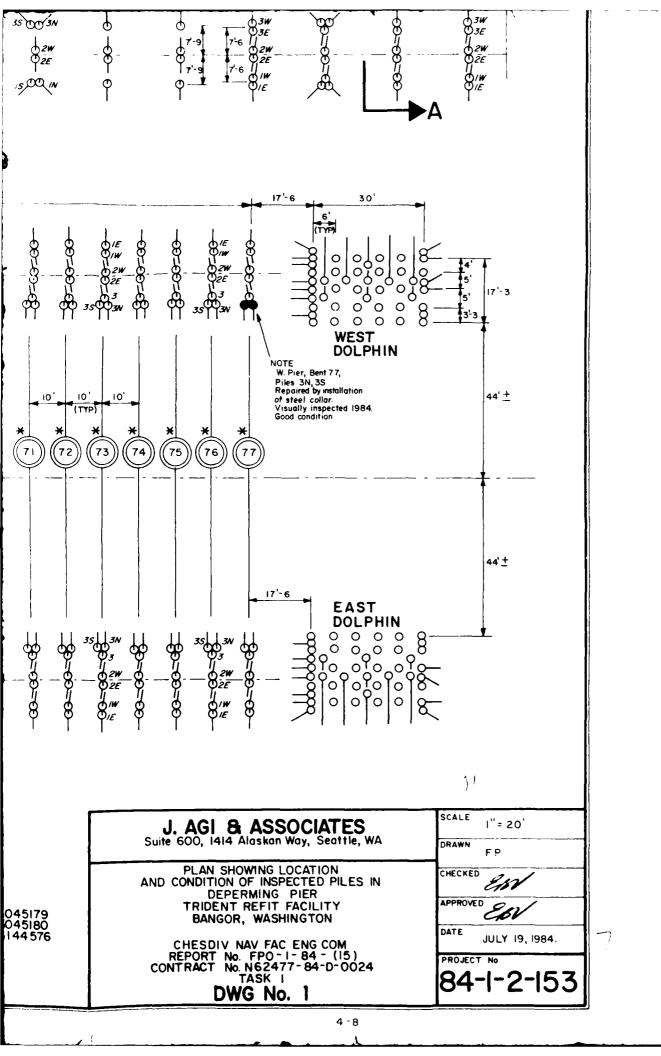


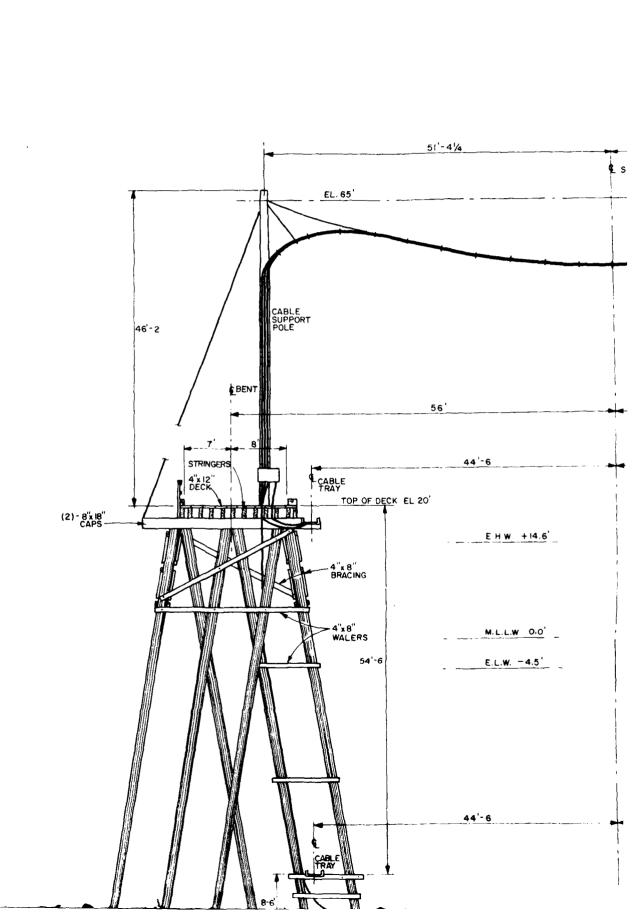


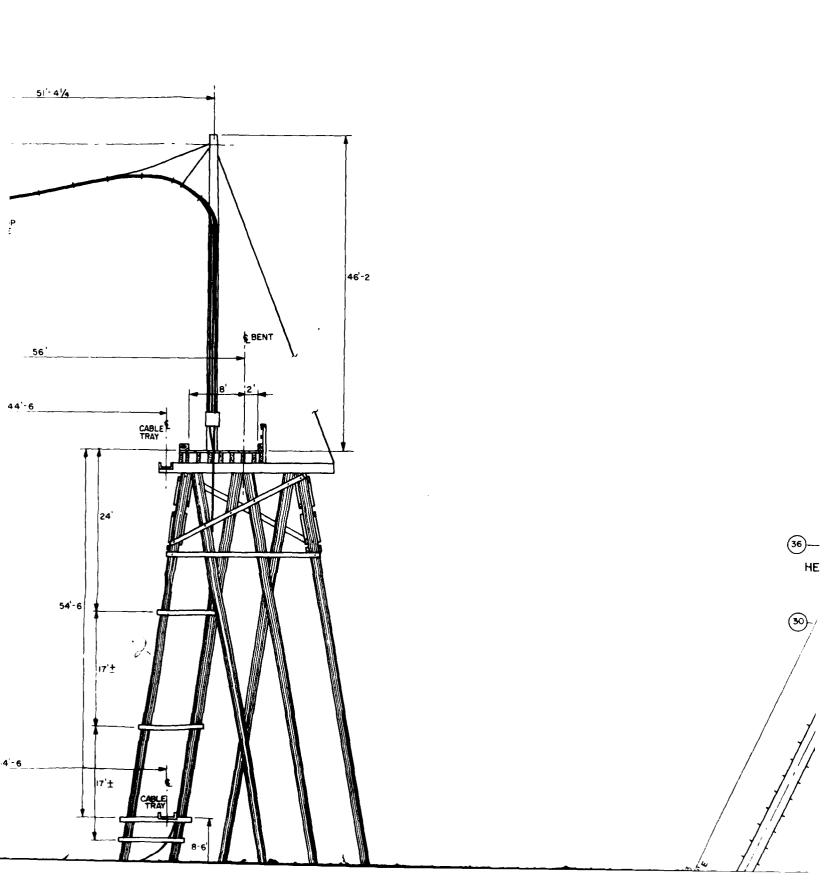
Navfac Dwg.No. 6045179 " " " 6045180 " " 6144576

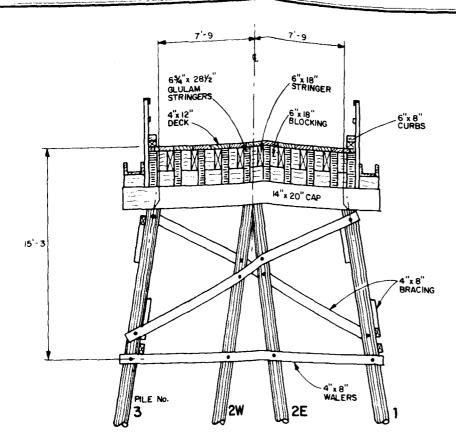
DEPERMING PIER
TRIDENT REFIT FACILITY
BANGOR, WASHINGTON

CHESDIV NAV FAC ENG CON REPORT No. FPO-1-84-(I CONTRACT No. N62477-84-D-( TASK I DWG No. 1

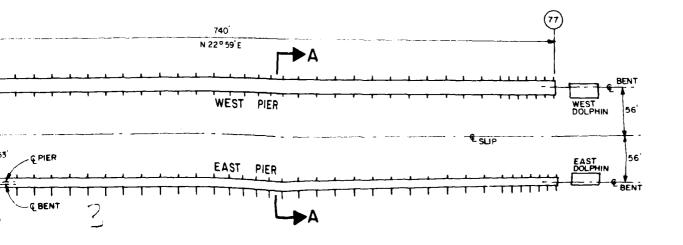






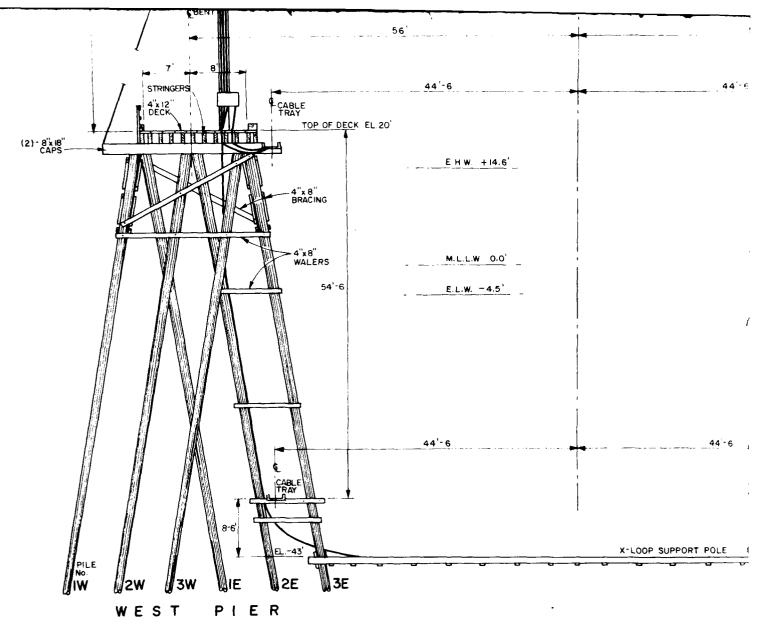


# SECTION B-B ACCESS TRESTLE - BENT 1

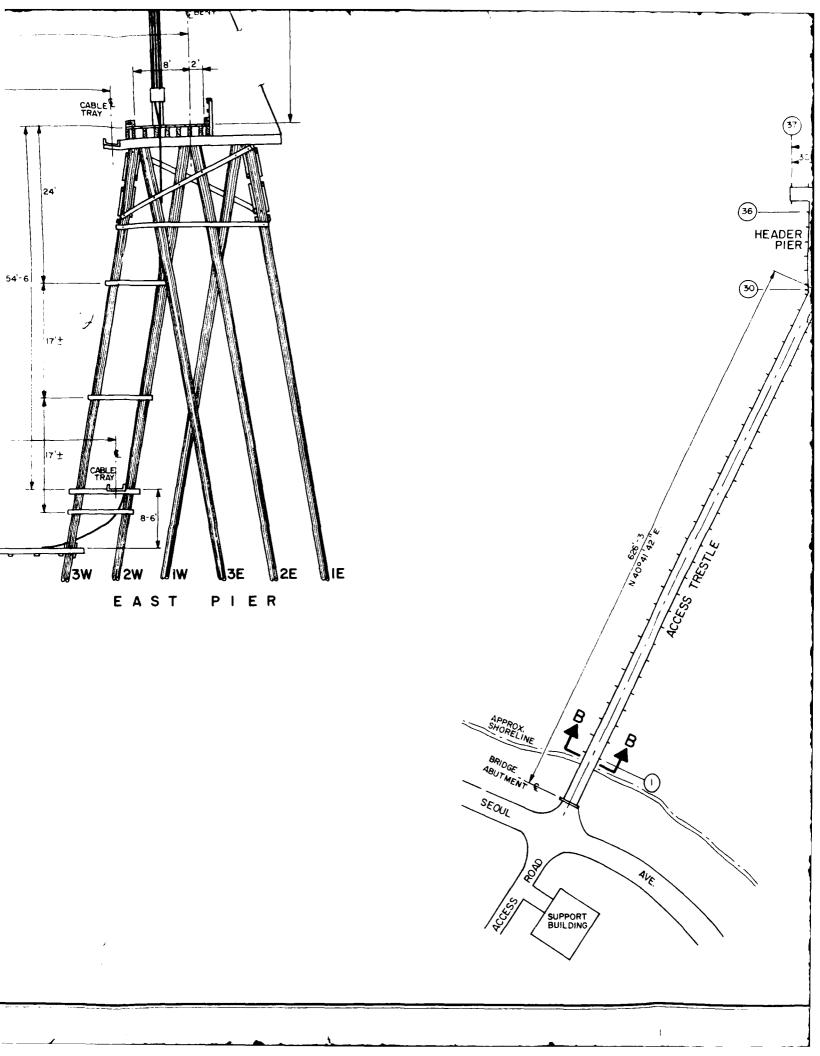




SITE PLAN



SECTION A-A EAST & WEST PIERS - BENT 59  $\frac{3}{32}$ 



740'
N 22°59'E

A

WEST PIER

WEST DOLPHIN 56'

SLIP

EAST DOLPHIN 56'

3/16" = 1'-0

~ € BENT

SITE PLAN

Reference Drawings

Navfac Dwg. No. 6045178 " " " 6045186 " " 6045217

J. AGI & ASSOCIATES
Suite 600, 1414 Alaskan Way, Seattle, WA

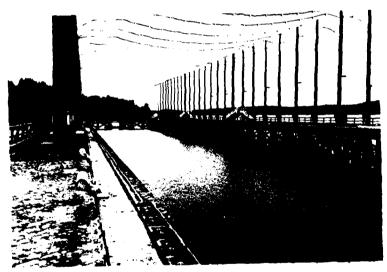
PLAN SHOWING
TYPICAL SECTIONS AND SITE PLAN
DEPERMING PIER
TRIDENT REFIT FACILITY
BANGOR, WASHINGTON

CHESDIV NAV FAC ENG COM
REPORT No. FPO-1-84-(15)
CONTRACT No. N62477-84-D-0024
TASK !
DWG. No. 2



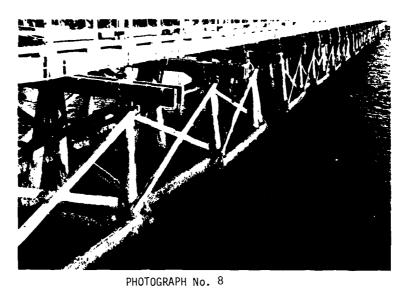
PHOTOGRAPH No. 6

Overview of the Deperming Pier at the Magnetic Silencing Facility, Bangor, Washington.

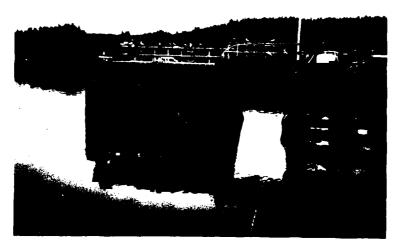


PHOTOGRAPH No. 7

 $\mathsf{East}$  and  $\mathsf{West}$  Piers of the Deperming Pier - looking south towards the Header Pier.



Typical timber brace framing of piling in the Deperming Pier.



 $\label{eq:photograph} \mbox{PHOTOGRAPH No. 9}$  Pile dolphins added to outside (north) end of finger piers.

### 4.3 OBSERVED INSPECTED CONDITION

## 4.3.1 Piles

The detailed inspection results showing piles examined and their condition are presented in Tables 1 and 2 and illustrated graphically on the preceding drawings.

The overall condition of the piles is excellent. Of the 254 piles examined, 250 piles are undamaged and are rated 100% residual cross-sectional area. Four piles have sustained minor mechanical damage in the form of "shakes" or narrow slivers breaking off of the pile surface. In piles 29-2W Access Trestle and 60-1W West Pier this mechanical damage has allowed some Bankia attack and entry, (See Photograph Nos. 10 and 11.) Piles 9-1 Access Trestle and 60-3E West Pier have sustained mechanical damage but no marine borer attack. Four additional piles (see Table 1) have sustained minor mechanical damage with no breaching of the creosote treated shell and no marine borer attack.

### 4.3.2 X-Loop Troughs

The overall condition of the 30 trough assembly members covered by this inspection, is good. No damage was found in the timber poles that span the gap between the piers or in the timber cross members which span the twin trough poles and support the three X-Loop cables. (See Photograph No. 12).

Marine borer damage, Limitatia and Bankia was found in the framing timbers which attach the trough poles to the finger pier bents. Evidence of this type of damage was noted throughout the finger piers, particularly in the East finger pier. (See Photograph No. 13). Should this damage progress from the cut end to the attachment bolt, the connection will be rendered ineffectual.

The mudline appears to slope down from the East to West pier. Every other trough was measured for mudline to bottom of trough distance. In some cases the trough poles are imbedded in the mudline under the East Pier with generally a 10-13 foot space under the West Pier. All troughs are uniformly horizontal and parallel hence the elevation profiles in Drawing 3 reflect the slope of the mudline for each measured trough.

### 4.3.3 Miscellaneous

In addition to the above noted results, other observations were made.

Incipient Limnoria attack was observed in some cut ends of wales and cross-bracing timbers. (See Photograph No.14).

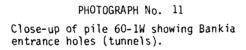
A general increase in marine fouling organisms was observed since the 1980 inspection. This fouling is not only attached to timber members but also to cable assembly bundles. (See Photograph No. 15).

Extensive Bankia damage was found in various cable assembly timbers. (See Photograph Nos. 16 and 17).



PHOTOGRAPH No. 10

Pile 60-1W of West Pier. 2% mechanical shake and Bankia attack.

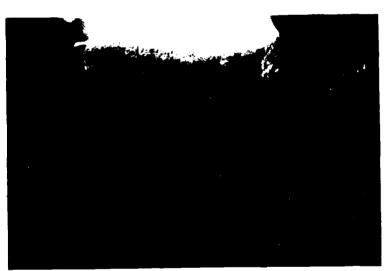






PHOTOGRAPH No. 12

 $\ensuremath{\mathsf{X-Loop}}$  Trough. Note minimal fouling growth on  $\ensuremath{\mathsf{X-Loop}}$  Cables running through trough.



PHOTOGRAPH No. 13

 $\ensuremath{\mathsf{X}}\text{-}\ensuremath{\mathsf{Loop}}$  Trough framing timber. Note heavy marine borer damage to cut-off end.



PHOTOGRAPH No. 14

Diagonal timber brace with fouling organisms removed to show incipient Limnoria attack.



PHOTOGRAPH No. 15

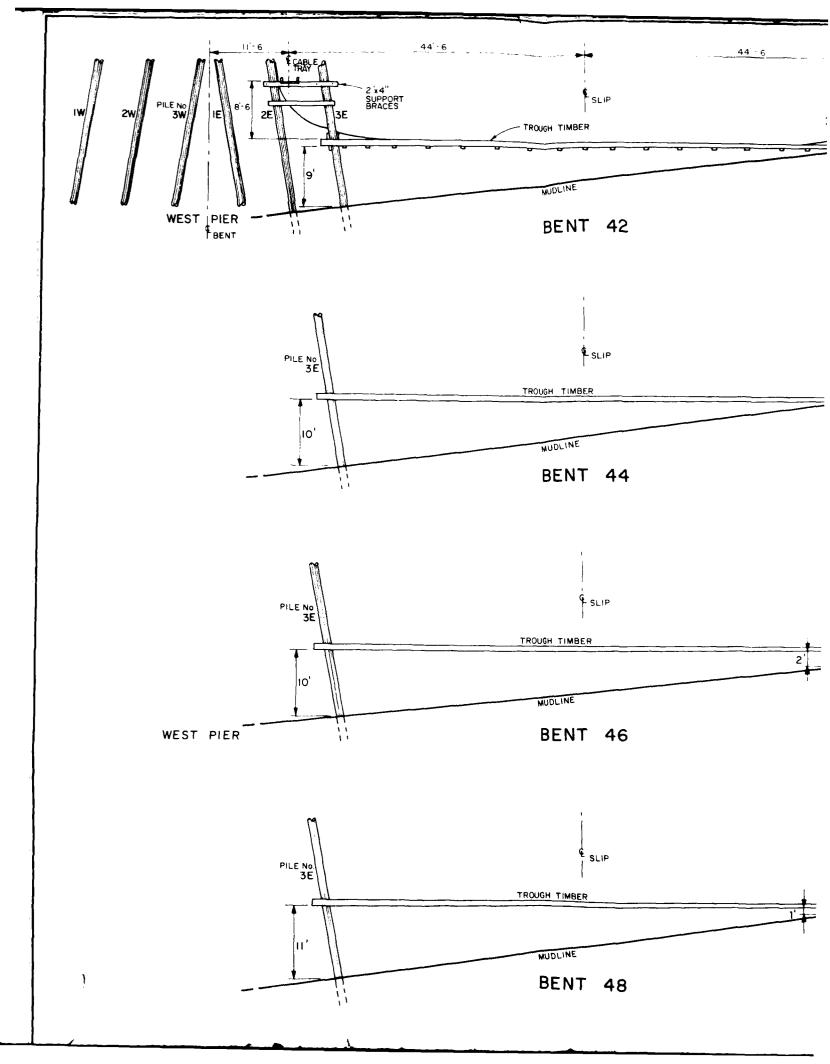
Extensive marine growth in the intertidal zone on cable assembly bundles.  $% \left\{ \left( 1\right) \right\} =\left\{ \left( 1\right$ 

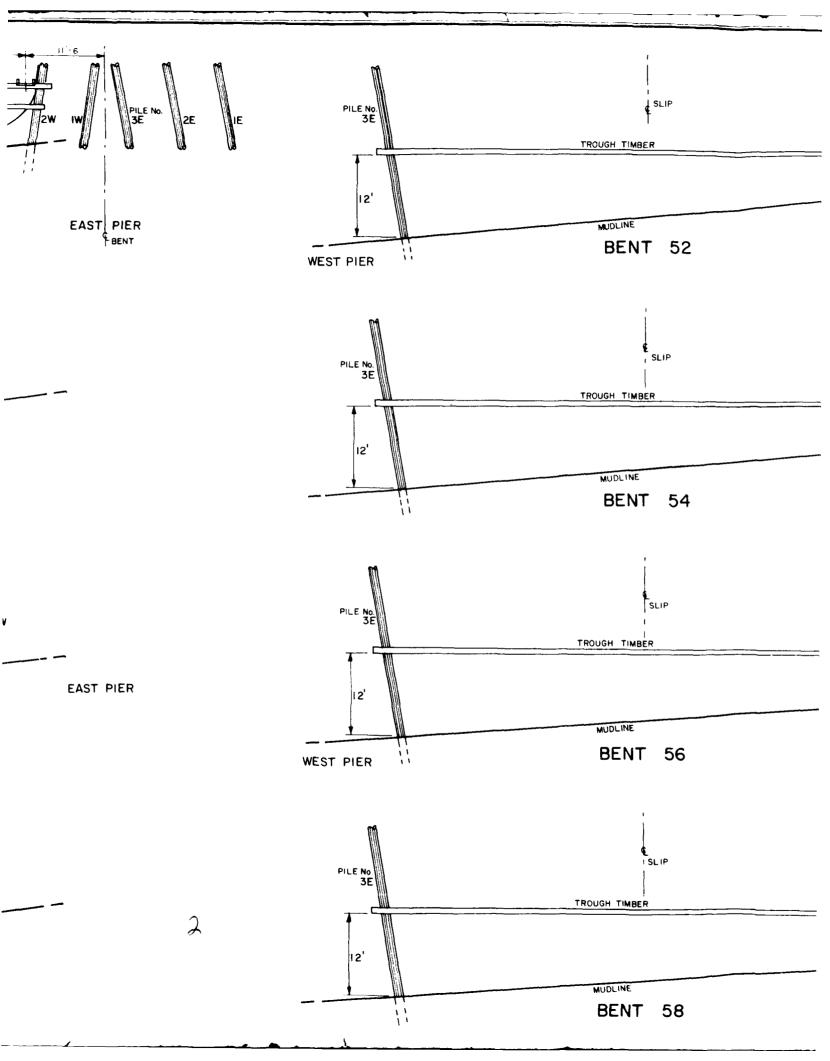


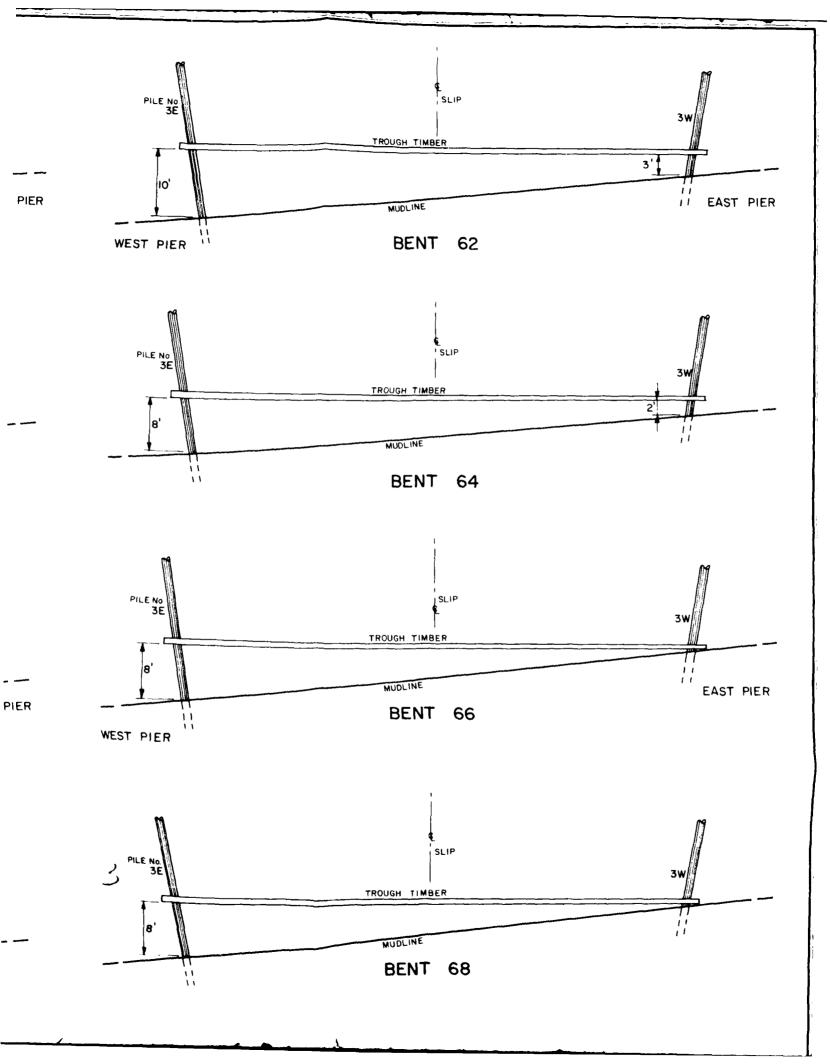
 ${\it PHOTOGRAPH~No.~16} \\ {\it Cable support/restraining timbers at Bent~40~of~East~Pier.} \\ {\it Note extensive~Bankia~damage.} \\$ 

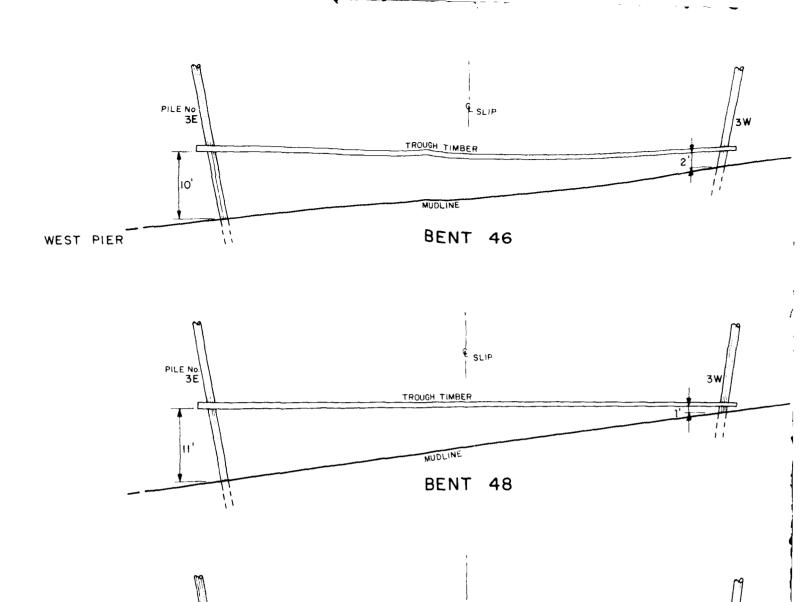


 $$\operatorname{PHOTOGRAPH}$  No. 17 Sample of cable support timber showing destruction by the internal marine borer, Bankia.









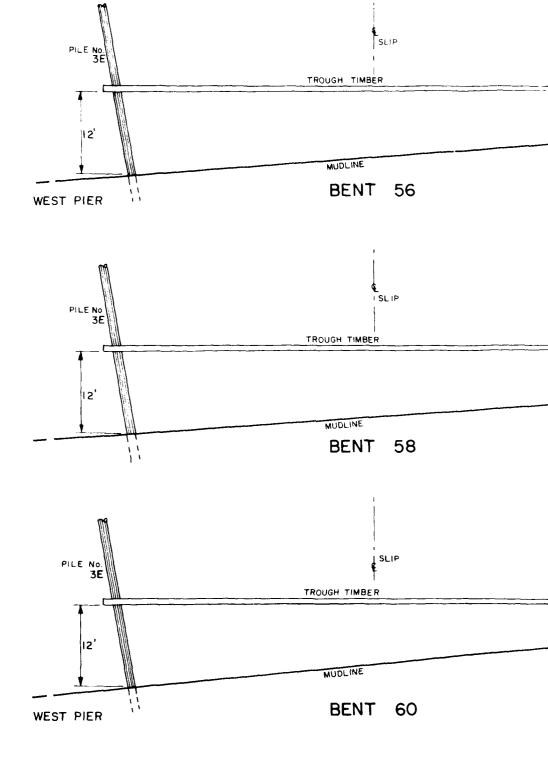
SLIP

MUDLINE

BENT 50

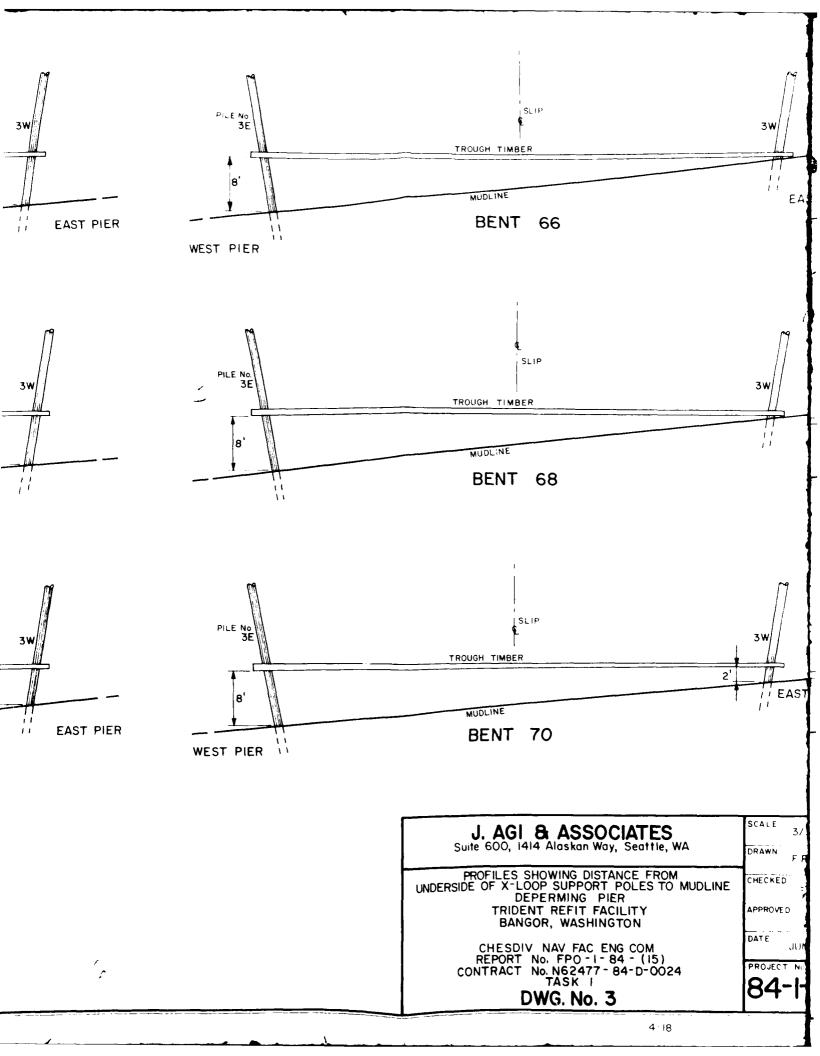
WEST PIER

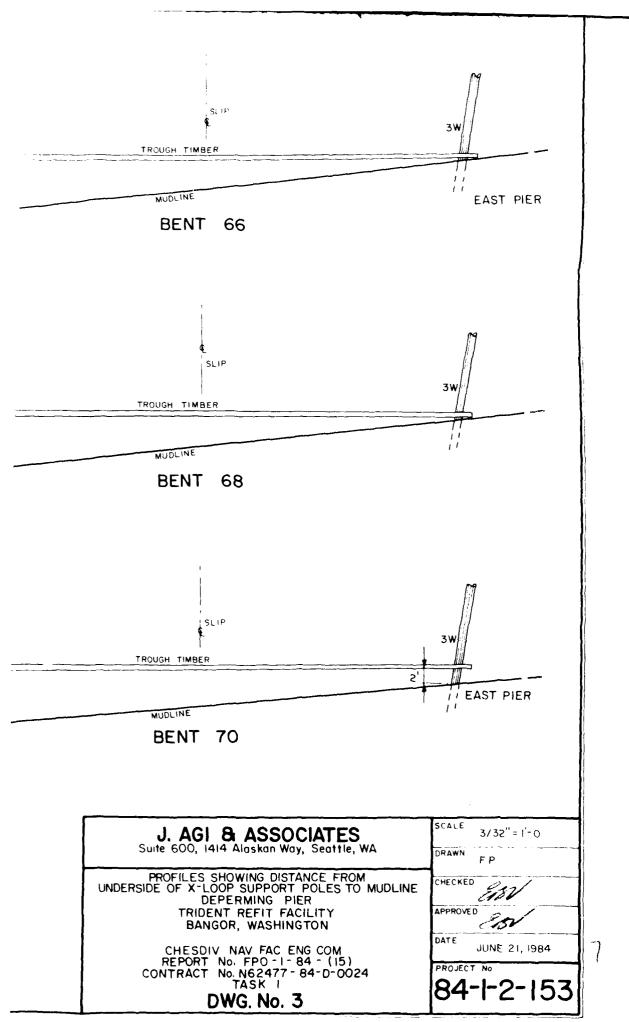
PILE NO.



EAST PIER

EAST PIER





4 18

### 4.4 STRUCTURAL CONDITION ASSESSMENT.

The overall condition of the timber piles is excellent. The current results show that 98.5% of the piles included in this inspection are undamaged and retain 100% of the original cross-sectional area. The minor mechanical damage noted in four piles does not detract from the structural integrity of the piles and the piles are still rated at 100%.

Four additional piles have sustained slightly greater damage and these piles are rated at 90% although at this time they may be considered to be at full capacity. Two of these latter piles have also sustained Bankia attack through the mechanical breach in the creosoted layer. Potentially this can lead to continued deterioration.

The damage found in the 1980 inspection has been repaired and the piles appear to be performing their function.

The combined results of the 1980 and 1984 inspection provide data on all the piles in the facility. This data provides a base-line for the "as built" condition of the facility which can be used as a reference for all future inspections.

The main poles of the X-loop trough are in good condition but marine-borer damage was found in the framing members at the ends of the timbers and other cable assembly timbers. Total destruction of some of these members was observed with extreme penetration of damage throuth the cut ends of some timbers.

Destruction of the members can render the assembly support system ineffectual and therefore possibly lead to damage to the cables.

The results of the current inspection show that both Limneria and Bankia attack are prevalent in this structure from the intertidal zone to the mudline.

### 4.5 RECOMMENDATIONS

Piles 29-2W, (Access Trestle) and 60-1W, (West Pier), have sustained mechanical damage and marine borer attack. The localized areas of damage should be encased in plastic wrap in order to halt the current attack, prevent furture attack and maintain piles at their present condition. The cost of this maintenance should be in the order of \$5,000.00 (See Executive Summary Table).

Maintenance cost of \$2500.00 per pile is based on quoted cost of plastic wrap of approximately \$50.00 per lineal foot installed. Hence cost of wrapping 50 feet of pile would be in the order of \$2500.00 per pile.

The level of damage observed in the cable assembly support timbers warrants a comprehensive inspection of these members.

In addition to the above inspection, it is also recommended that periodic inspections at three to six year intervals be carried out. This is particularly significant in this structure since widespread Limnoria and Bankia damage was found throughout.

Regular inspections will serve to identify any deficient areas and thereby assure the structural integrity of the facility. All subsequent inspections should use this report as a datum or base line.

# LEGEND TO TABLES

= Approximately Appx. В. = Bankia setacea ₿R = Battered pile = East ITZ = Intertidal zone L. = Limnoria MBC = Marine-borer cavity MB = Marine-borer MDL = Mudline Mech. = Mechanical m.1.w. = Mean low water = North = South = West

TABLE 1

REMAINING CROSS-SECTIONAL AREA AND DESCRIPTION OF DAMAGE TO INDIVIDUAL PILING

MAGNETIC SILENCING FACILITY, BANGOR, WASHINGTON

Pile ID Bent Pile	Area Rating	Remarks	Pile ID Bent Pile	Area Rating	Remarks
ACCESS TRES	STLE		17 - 3N	100	
5 - 1	100		3S	100	
2E	100		18 - 1	100	
2 <b>W</b>	100		2E	100	
3	100		2W	100	
6 - 1	100		3	100	
2E	100		21 - 1	100	
2W	100		2E	100	
3	100		2W	100	
9 - 1	90	5% Mech. abrasion & shaking.	3	100	
2E	100	,	22 - 1N	100	
2W	100		18	100	
3	100		2E	100	
10 - 1	100		2W	100	
2E	100		3N	100	
2W	100		3S	100	
3	100		25 - 1	100	
13 - 1	100		2E	100	
2E	100		2W	100	
2W	100		3	100	
3	100		26 - 1	100	
14 - 1	100		2E	100	
2E	100		2W	100	
2W	100	[	3	100	
3	100		29 - 1	100	
17 - 1N	100		2E	100	
15	100		2W	90	1% Mech. & B.damage at -30 feet.
2E	100		3	100	
2W	100	}			,

TABLE 1

REMAINING CROSS-SECTIONAL AREA AND DESCRIPTION OF DAMAGE TO INDIVIDUAL PILING

MAGNETIC SILENCING FACILITY, BANGOR, WASHINGTON

Pile ID Bent Pile	Area Rating	Remarks	Pile ID Bent Pile	Area Rating	Remarks
HEADER PIE	R		44 - 1W	100	
31 - 1	100		1E	100	
2N	100		2W	100	
2\$	100		2E	100	
3	100		3W	100	
32 - 1	100		3E	100	
2N	100		45 - 1W	100	
2\$	100		1E	100	
3	100		2W	100	
36 - 1	100		2E	100	
2N	100		3W	100	
25	100		3E	100	
3	100		48 - 1W	100	
	1		1E	100	
36.5 - 1	100		2W	100	
2N	100		2E	100	
2\$	100		3W	100	
3	100		3E	100	
WEST PIER	1 1		49 - 1W	100	
39 - 1	100		15	100	
2W	100		2W	100	
2E	100		2E	100	
3	100		3W	100	
	1 1		3E	100	
41 - 1W	100		(51 - 2E)	Repaired	Stainless steel sleeve
1E	100		, , , ,	•	from MDL up 10' appx.
2W	100				1/8" thick. Good
2E	100				condition.
3W	100				
3E	100		1		l

TABLE 1

REMAINING CROSS-SECTIONAL AREA AND DESCRIPTION OF DAMAGE TO INDIVIDUAL PILING

MAGNETIC SILENCING FACILITY, BANGOR, WASHINGTON

Pile ID Bent Pile	Area Rating	Remarks	Pile ID Bent Pile	Area Rating	Remarks
52 - 1W	100		60 - 1E	100	
1E	100		2W	100	
2W	100		2E	100	
2E	100		3W	100	
3W	100		3E	90	5% shake 1" deep at
3E	100				$-15'$ , no $\underline{B}$ .
53 - 1W	100		61 - 1W	100	
1E	100	ļ	1E	100	
2W	100		2W	100	
2E	100		2E	100	
3W	100		3M	100	
3E	100		3E	100	
54 - 1W	100		64 - 1W	100	
3E	100		1E	100	
			2W	100	
56 - 1W	100		2E	100	
1E	100		3W	100	
2W	100	1% shake -5',no MB	3E	100	
2E	100	5% shake -20',no MB	65 - 1W	100	
3W	100		1E	100	
3E	100		2W	100	
57 - 1W	100		2E	100	
1E	100		3W	100	
2W	100		3E	100	
2E	100				
3W	100	1% shake appx15'	68 - 1N	100 100	ll% chake off mile of
3E	100		15	100	1% shake off pile at 7' above MDL.
60 - 1W	90	2% Mech.shake	1 1	100	
		<u>B</u> . tunnels @ -10'	2W	100	1

TABLE 1

REMAINING CROSS-SECTIONAL AREA AND DESCRIPTION OF DAMAGE TO INDIVIDUAL PILING

MAGNETIC SILENCING FACILITY, BANGOR, WASHINGTON

Pile ID Bent Pile	Area Rating	Remarks	Pile ID Bent Pile	Area Rating	Remarks
68 - 2E 3 3N 3S 69 - 1N	100 100 100 100 100		45 - 1 2E 2W 3 48 - 1	100 100 100 100 100	
1S 1 2W 2E	100 100 100		2E 2W 3	100 100 100	
3 3N 3S	100 100 100 100		49 - 1 2E 2W 3	100 100 100 100	
(77 - 3S) (3N)	Repaired Repaired	10-12' sleeve 0' down, good. 15' sleeve mid tide down.	52 - 1 2E 2W 3	100 100 100 100	
EAST PIER  40 - 1 2E 2W 3	100 100 100 100		53 - 1 2E 2W 3	100 100 100 100	
41 - 1 2E 2W 3	100 100 100 100		56 - 1 2E 2W 3	100 100 100 100	
44 - 1 2E 2W 3	100 100 100 100		57 - 1E 1W 2E 2W	100 100 100 100	

TABLE 1

REMAINING CROSS-SECTIONAL AREA AND DESCRIPTION OF

DAMAGE TO INDIVIDUAL PILING

MAGNETIC SILENCING FACILITY, BANGOR, WASHINGTON

Pile ID Bent Pile	Area Rating	Remarks	Pile ID Bent Pile	Area Rating	Remarks
57 - 3E	100		68 - 2E	100	{
3W	100		2W	100	
60 - 1E	100		3	100	
1W	100		3N	100	j
2E	100		35	100	j
3E	100		69 - 1W	100	}
3W	100		1E	100	}
	1		2W	100	}
61 - 1E	100		2E	100	
1 W 2 E	100		2.8	100	
2E 2W	100		2.9N	100	
2 W 3 E	100		2.95	100	
3E	100		3N	100	
	(		35	100	
64 - 1E	100		1		
1W	100		1		
2E	100		1		
2W	100		1	1	
3E	100		{		
3W	100		1		
65 - 1E	100		1		
1W	100		1		
2E	100		{		
2W	100				
3E	100		}		••
3W	100		}		
68 - 1	100		ì		
1N	100		- 1 - 1	Į	
15	100			ļ	

T-6

TABLE 2

NUMERICAL AND PERCENTAGE DISTRIBUTION OF DAMAGE

MAGNETIC SILENCING FACILITY, BANGOR, WASHINGTON

PERCENT REMAINING CROSS-SECTIONAL	NUMBER AND PE PILES IN EACH AREA	
AREA	NUMBER	PERCENT
100	250	98.5%
90	4	1.5%
75	0	О
50	0	0
25	0	0
0	0	0
TOTALS:	254	100%

TABLE 3

COLUMN LOAD CAPACITY CALCULATIONS

1984 INSPECTION

T-8

7

Pile load capacities were calculated by an inhouse computer program using the Southern Pine Association modified Euler equation for long columns where,

$$P_{ult} = \frac{0.30 \text{ E}}{(L/d)^2} \times A$$

Pile lengths (L) were taken from mudline to cap. The unsupported length of pile (USL) was taken from below the bracing at the top and ten feet was added at the mudline to allow for the point of fixity. Effective length factor (K) of 0.8 was used. Other program parameters used are described below:

Bent	-	bent identification
PIle	-	pile (row) identification
ITP	-	type of wood (l=fir)
Length	-	unsupported length - in this project, 10 feet was
		added onto the USL since the point of fixity at
		the bottom was considered to be 10 feet below the
		mudline.
EFF-L Factor	-	effective length factor, K. K=0.8 was used for
		these calculations
ORG-DIA	-	original pile diameter - taken at mudline
EFF-ARA	-	remaining cross-sectional area based on sonic testing,
		on the following basis:

Factor	Cross-Sectional area remaining
ractor	1 emaining
1.00	100%
0.90	90%-100%
0.75	75%-100%
0.50	50%- 75%
0.25	25%- 50%
0.005*	0%- 25%

(\*the program cannot handle 0.000)

EFF-DIA - effective pile diameter

EFF-ARA - effective cross-sectional area of pile

- compression parallel to grain, in psi, for fir

L/D - length over diameter ratio

С

P-ULT, LB - ultimate loading capacity of the pile column in pounds. This refers only to the column length as shown and does not take into account soil conditions (other than to establish the point of fixity), and what the pile was originally driven to in terms of design loads.

It is strongly emphazied that these calculations deal only with the ultimate capacity of the wood pile column within the fixity conditions and USL parameters as perceived. These load calculations are <u>not</u> design load calculations.

(Structural analysis in light of lateral loading was not included since this is considerably beyond the scope of this project. Such an analysis would require details on imposed lateral loading and structural analysis of the entire facility in terms of these loads and existing structural parameters.) TABLE 3

COMPUTER PRINT OUT

1984

MSF PILE LOADING CAPACITIES (P ULTIMATE)
NAVAL SURMARINE BASE, BANGOR, WA AUGUST 1987

8 -888 - 888 - 888 - 888 - 888	0 P I L E E E E E E E E E E E E E E E E E E	APPROACHWAY TRESTLE 2	N		FIT	174 - 1444 1444 9444 4444 4444	# 54444 4444 64444 4444 4444 # 54444 4444 64444 44444 44444 44444 44444 44444 44444	<b>◀</b> ₩	P S C C C C C C C C C C C C C C C C C C	L/OS 30 30 30 30 30 30 30 30 30 30 30 30 30	43797. 43797. 43797. 43797. 43797. 43797. 43797. 43797. 43797. 43797. 43797. 43797.
	355 355 355 355 355 355 355 355 355 355		88.8 89.8 80.8		1.000 1.000 1.000 1.270 1.270 1.270 1.270 1.270		1.000 1.000 1.000 1.270 1.270 1.270 1.270	113.10 113.10 113.10 113.10 182.41 182.41 182.41	00444446666666666666666666666666666666	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	46133. 46133. 46133. 46133. 85579. 85579. 85579. 85579. 85579.
	32E + 32E		00.03.04 00.03.04 00.03.04 00.08.04 00.09.04	0.800 0.800 0.800 0.800 0.800 0.800	1.270	00000	1,270 1,270 1,270 1,270 1,270	182.41 182.41 182.41 182.41 182.41	469 469 469 469 412	33 33 33 35 3 3 3 3 3 3 3 3 3 3 3 3 3 3	85579. 85579. 85579. 85579. 75216.
	N N N		50.00 50.00 50.00	0.800	1.270	88 88	1.270 1.270 1.270	182.41 182.41 182.41	412. 412. 380.	36 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	75216. 75216. 69319. 69319.

MSF PILE LOADING CAPACITIES (P ULTIMATE)

BENT	PILE	ITP	MSF P NAVAL SI	UBNARIN 1 EFF-L	FILE LUADING CASUBNARINE BASE, -1 EFF-L ORG-DIA B	PACITIE BANGOR EFF-ARA	W. Y.	ULTIMATE) AUGUST 1984 A EFF-ARA	<b>7</b>	7/08	P-ULT
	ů	•	F 6		- 0	FACTOR	- 0		P51	ć	18
	7 € 7 €		8 8 8 8 8	88	1.270	80		182.41	380.	36	69319
	3 S S		50.00 50.00	0 0	1.270	88	1.270		380.	36 36	69319. 69319.
LC	- 4		53.00	0.800	1.330	000	1.330	200.06	371.	36	74205.
	3 13 15	- <del>-</del>	53.00 53.00	008	1.330	88	1.330	200.06 200.06	371.	36	74205.
9	-	-	4.	0.800	1.330	1.000	1.330	200.06	357.	37	71482.
	3 2 E		8 5 8 8 8 8	000	1.330	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	330	200.06 200.06 200.06	357. 357.	37 37	71482.
	-	-		0.800	1.330	1.000	1.330	200.06	310.	39	61962.
	2E		58.00	0.800	1.330	00	1.330	200.06	310	33	61962.
	3 m	- <b>-</b>	58.00 .80	0.800	1.330	88	1.330	200.06	3 6	5 G	61962.
HEADER	ER PIER	œ									
	- 8	-	60.00	0.800	1.420	1.000	1.420	228 05	330.	38	75236.
	2 0		9 6		1 420		1.420		330	9 8	75236
	) (n	-	60.00		1.420	-	1.420		330	38	75236.
	<b>-</b> i	-	63.00		1.420	000.	1.420	228.05	299	040	68242
	N N		63.8	0 800	1.420		420	228.05	n 0	0 4	68242.
	9 6		63.8	0.8	1.420	-	1.420	228.05	299.	0 0	68242.
	-	-	66.00		1.420		1.420	228.05	273.	42	62179.
	2N 20 20 20 20 20 20 20 20 20 20 20 20 20		66.8	0.80	4.420	0 6	1.420	228.05 228.05	273	4 4	62179
	, , ,	- <b>-</b> -	99		1.420	-	1.420	228.05	273.	2	62179.
ı,	<b>-</b>	-	66.00	0.800	4.	-	1.420	228.05	273	2.5	62179
	2 S		86.99	0 0	420		1.420	228.05	273	4 4	
	) (C	•	66.00	0.800	1.420	<del>,</del>	1.420		273.	42	7
WEST	r PIER										
<b>3</b> 0	<b>-</b> 3		72.00	0.800	1.420		1.420	228.05 228.05	229.	46	52247
	3 S E		72.00	0.800	1.420	000	1.420	228.05 228.05	229.	46	52247.
¥ 1 4	<b>3</b>	-	72.00	0.800	1.440	1.000	1.440	234.52	236.	45	55254

MSF PILE LOADING CAPACITIES (P ULTIMATE)
NAVAL SUBMARINE BASE, BANCOR, WA AUGUST 1984
-1

BENT	PILE	ITP	LENGTH FT	EFF-L FACTOR	ORG-DIA FT	EFF-ARA Factor	EFF-DIA FT	EFF-ARA IN2	PSI	۲/۵۶	P-ULT LB
	3322 BEEKE		72.00	000000000000000000000000000000000000000	1, 440 1, 440 1, 440 1, 440 1, 440	000000	1. 4 4 4 0 0 0 4 4 4 0 0 0 0 4 4 4 0	234.52 234.52 234.52 234.52 234.52	236. 236. 236. 236.	4 4 4 4 4 ស ស ល ស ៤	55254. 55254. 55254. 55254.
4 3 3	3 3 5 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			000800000000000000000000000000000000000	44.1 444.1 444.1 444.4 6444.4	0000000	044 044 044 044 044 044 044 044	មាលមាលមា	2223	9 4 4 4 4 4 4 9 9 9 9 9 9 9 9 9 9 9 9 9	0000000
¥3.	2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3		74.00 74.00 74.00 74.00 74.00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.440 1.440 1.440 1.440 1.440	000000	1.440 1.440 1.440 1.440 1.440	234.52 234.52 234.52 234.52 234.52 234.52	223 223 223 223	9 4 4 4 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	52307. 52307. 52307. 52307. 52307.
¥84	2000 0000 0000 0000		77 77 77 78 78 78 78 78 78 78 78 78 78 7	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	44.4 0004.1 0004.1 0004.1	0000000	4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.	221.67 221.67 221.67 221.67 221.67 221.67	195. 195. 195. 195.	900 900 900 900	43163. 43163. 43163. 43163.
¥0,	2022244 MEMERE	****	77.08	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4.400 4.400 4.400 4.400 4.400	900000	4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.	221.67 221.67 221.67 221.67 221.67 221.67	195. 195. 195. 195.	00000000000000000000000000000000000000	43163 43163 43163 43163 43163
82W	3322 3322 332 332 332 332 332 332 332 3		77.00	0080000	1.450 1.450 1.450 1.450 1.450	000000000000000000000000000000000000000	1,450 1,450 1,450 1,450 1,450	237.79 237.79 237.79 237.79 237.79	2009 2009 2009 2009	2 4 4 4 4 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	49667 49667 49667 49667 49667
78 CC CC	3 E E E E E E E E E E E E E E E E E E E	****	77.00 77.00 77.00 77.00 77.00	00.800 00.800 00.800 00.800 00.800	1.450 1.450 1.450 1.450 1.450	0000000	1.450 1.450 1.450 1.450 1.450	237.79 237.79 237.79 237.79 237.79	209 209 209 209	4 4 4 4 4 4 8 8 8 8 8 8	49667 49667 49667 49667 49667
54 te	3 m 3		80.00 77.00 78.00	0.800	1.450	000.1	1,450	237.79 237.79 237.79	193.	550 84 4 89 6	46012. 49667.

MSF PILE LOADING CAPACITIES (P ULTIMATE) NAVAL SUBMARINE BASE, BANGOR, WA AUGUST 1984

1.         78. 00         0.800         1.450         1.000         1.450         237.79         204. 49         48402           2.6         1         78. 00         0.800         1.450         1.000         1.450         237.79         204. 49         48402           2.6         1         7.8         0.0         0.800         1.450         1.000         1.450         277.79         204. 49         48402           2.6         1         0.000         1.450         1.000         1.450         277.79         204. 49         48402           2.6         1         0.000         1.450         277.79         204. 49         48402           2.6         1         0.000         1.450         277.79         204. 49         48402           2.6         1         0.000         1.450         277.79         204. 49         48402           2.6         1         0.000         1.450         1.000         1.450         277.79         204. 49         48402           2.6         1         0.000         1.450         1.000         1.450         277.79         204. 49         48402           2.6         1         0.000         1.450 <t< th=""><th>PILE</th><th>ПТР</th><th>LENGTH FT</th><th>EFF-L FACTOR</th><th>ORG-DIA FT</th><th>EFF - ARA FACTOR</th><th>EFF-DIA FT</th><th>EFF-ARA In2</th><th>c PSI</th><th>r/ps</th><th>P-ULT LB</th></t<>	PILE	ПТР	LENGTH FT	EFF-L FACTOR	ORG-DIA FT	EFF - ARA FACTOR	EFF-DIA FT	EFF-ARA In2	c PSI	r/ps	P-ULT LB
1         78.00         0.800         1450         1377         324, 49           1         78.00         0.800         1450         1000         1450         2377         324, 49           1         78.00         0.800         1450         1000         1450         2377         324, 49           1         78.00         0.800         1450         1000         1450         2377         324, 49           1         78.00         0.800         1450         1000         1450         2377         324, 49           1         78.00         0.800         1450         1000         1450         2377         324, 49           1         78.00         0.800         1450         1000         1450         2377         324, 49           1         78.00         0.800         1450         1000         1450         2377         324, 49           1         78.00         0.800         1450         1000         1450         2377         324, 49           1         78.00         0.800         1450         1000         1450         2377         324, 49           1         78.00         0.800         1450         1000	Ŧ	-	œ		4	1.000	1.450	37.7	204		48402
78.00         0.8800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00 <th>3 I</th> <th>-</th> <th>œ (</th> <th></th> <th>4.</th> <th>00.5</th> <th>4.</th> <th>37.7</th> <th>204</th> <th>6 9</th> <th>48402</th>	3 I	-	œ (		4.	00.5	4.	37.7	204	6 9	48402
78.00         0.800         1.450         1.000         1.450 <td< th=""><th>2 7</th><th></th><th>20 a</th><th></th><th>4,</th><th>86</th><th>4.</th><th>37.7</th><th>204</th><th>0 4</th><th>48402</th></td<>	2 7		20 a		4,	86	4.	37.7	204	0 4	48402
18.00         0.800         1.450         1.000         1.450         207.79         204. 49           18.00         0.800         1.450         1.000         1.450         227.79         204. 49           18.00         0.800         1.450         1.000         1.450         227.79         204. 49           178.00         0.800         1.450         1.000         1.450         227.79         204. 49           178.00         0.800         1.450         1.000         1.450         227.79         204. 49           178.00         0.800         1.450         1.000         1.450         227.79         204. 49           178.00         0.800         1.450         1.000         1.450         227.79         204. 49           178.00         0.800         1.450         1.000         1.450         227.79         204. 49           178.00         0.800         1.450         1.000         1.450         227.79         204. 49           178.00         0.800         1.450         1.000         1.450         227.79         204. 49           178.00         0.800         1.450         1.000         1.450         227.79         204. 49           17	3.5	- <b></b>	9 00		7	88	1.4	37.7	204	1 4 0 0	48402
18.00         0.800         1.450         1.000         1.450         237.79         204. 49           18.00         0.800         1.450         1.000         1.450         237.79         204. 49           18.00         0.800         1.450         1.000         1.450         237.79         204. 49           18.00         0.800         1.450         1.000         1.450         237.79         204. 49           18.00         0.800         1.450         1.000         1.450         237.79         204. 49           18.00         0.800         1.450         1.000         1.450         237.79         204. 49           18.00         0.800         1.450         1.000         1.450         237.79         204. 49           18.00         0.800         1.450         1.000         1.450         237.79         204. 49           18.00         0.800         1.450         1.000         1.450         237.79         204. 49           18.00         0.800         1.450         1.000         1.450         237.79         204. 49           18.00         0.800         1.450         1.000         1.450         237.79         204. 49           18.00	3	-	60		1.450	-	1.450	37.7	204		48402
1         78         00         0800         1.450         1.000         1.450         237         79         254         49           1         78         00         0.800         1.450         1.000         1.450         237         79         204         49           1         78         00         0.800         1.450         1.000         1.450         237         79         204         49           1         78         00         0.800         1.450         1.000         1.450         237         79         204         49           1         78         00         0.800         1.450         1.000         1.450         237         79         204         49           1         78         00         0.800         1.450         1.000         1.450         237         79         204         49           1         78         00         0.800         1.450         1.000         1.450         237         79         204         49           1         78         00         0.800         1.450         1.000         1.450         237         79         204         49           1	Ŧ	-	60		1.450	-	1.450	37.7	204		48402
1         78.00         0.800         1450         1.450         237.79         204         49           1         78.00         0.800         1.450         1.000         1.450         237.79         204         49           1         78.00         0.800         1.450         1.000         1.450         237.79         204         49           1         78.00         0.800         1.450         1.000         1.450         237.79         204         49           1         78.00         0.800         1.450         1.000         1.450         237.79         204         49           1         78.00         0.800         1.450         1.000         1.450         237.79         204         49           1         78.00         0.800         1.450         1.000         1.450         237.79         204         49           1         78.00         0.800         1.450         1.000         1.450         237.79         204         49           1         78.00         0.800         1.450         1.000         1.450         237.79         204         49           1         78.00         0.800         1.450         <	3.M	-	60		1.450	-	1.450	37.7	204		48402
1         78         00         0.800         1,450         1,450         237.73         204         49           1         78         00         0.800         1,450         1,000         1,450         237.79         204         49           1         78         00         0.800         1,450         1,000         1,450         237.79         204         49           1         78         00         0.800         1,450         1,000         1,450         237.79         204         49           1         78         00         0.800         1,450         1,000         1,450         237.79         204         49           1         78         00         0.800         1,450         1,000         1,450         237.79         204         49           1         78         00         0.800         1,450         1,000         1,450         237.79         204         49           1         78         00         0.800         1,450         1,000         1,450         237.79         204         49           1         78         0         0.800         1,450         1,000         1,450         237.79	2E	-	8		4	-	4	37.7	204	67	48402
1         78.00         0.800         1.450         1.000         1.450         237.79         274. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         75.00         0.800         1.450         1.000         1.450         237.79         204. 49           1 </td <th>æ</th> <td>-</td> <td>8</td> <td></td> <td>4</td> <td><del>-</del></td> <td>4</td> <td>37.7</td> <td>204</td> <td>49</td> <td>48402</td>	æ	-	8		4	<del>-</del>	4	37.7	204	49	48402
78.00         0.800         1450         1000         1450         237.79         204. 49           78.00         0.800         1450         1000         1450         237.79         204. 49           78.00         0.800         1450         1000         1450         237.79         204. 49           78.00         0.800         1450         1000         1450         237.79         204. 49           78.00         0.800         1450         1000         1450         237.79         204. 49           78.00         0.800         1450         1000         1450         237.79         204. 49           78.00         0.800         1450         1000         1450         237.79         204. 49           78.00         0.800         1450         1000         1450         237.79         204. 49           78.00         0.800         1450         1000         1450         237.79         204. 49           75.00         0.800         1450         1000         1450         237.79         204. 49           75.00         0.800         1450         1000         1450         237.79         204. 49           75.00         0.800         <	3E	-	œ		4	-	1.450	37.7	274	49	48402
1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         75.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1 </td <th>3</th> <td>-</td> <td></td> <td></td> <td>1.450</td> <td>000</td> <td>1.450</td> <td>37.7</td> <td>204</td> <td></td> <td>•</td>	3	-			1.450	000	1.450	37.7	204		•
78.00         0.800         1450         1000         1450         237.79         204.49           78.00         0.800         1450         1000         1450         237.79         204.49           78.00         0.800         1450         1000         1450         237.79         204.49           78.00         0.800         1450         1000         1450         237.79         204.49           78.00         0.800         1450         1000         1450         237.79         204.49           78.00         0.800         1450         1000         1450         237.79         204.49           78.00         0.800         1450         1000         1450         237.79         204.49           78.00         0.800         1450         1000         1450         237.79         204.49           75.00         0.800         1450         1000         1450         237.79         204.49           75.00         0.800         1450         1000         1450         237.79         220.44           75.00         0.800         1450         1000         1450         237.79         220.44           75.00         0.800         1450 <th>Ţ</th> <td>· •</td> <td>. α</td> <td></td> <td>. &lt;</td> <td>8 8</td> <td>- CRA</td> <td>27 7</td> <td></td> <td></td> <td>ď</td>	Ţ	· •	. α		. <	8 8	- CRA	27 7			ď
78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           75.00         0.800         1.450         1.000         1.450         237.79         204. 49           75.00         0.800         1.450         1.000         1.450         237.79         204. 49           75.00         0.800         1.450         1.000         1.450         237.79         220. 47           75.00         0.800         1.450         1.000         1.450         237.79         220. 47           75.00	. 5	~ •	• a		, ,	38	7.4				0 0
1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1 </td <th>, C</th> <td>- •</td> <td>0 a</td> <td></td> <td>000</td> <td>38</td> <td>0.4</td> <td>7 - 10</td> <td>5 6</td> <td></td> <td>0 0</td>	, C	- •	0 a		000	38	0.4	7 - 10	5 6		0 0
78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           78.00         0.800         1.450         1.000         1.450         237.79         204. 49           75.00         0.800         1.450         1.000         1.450         237.79         204. 47           75.00         0.800         1.450         1.000         1.450         237.79         220. 47           75.00         0.800         1.450         1.000         1.450         237.79         220. 47           75.00         0.800         1.450         1.000         1.450         237.79         220. 47           75.00         0.800         1.450         1.000         1.450         237.79         220. 47           75.00	y 2		0 a		000	38	2 4		5 6	n (	0 0
1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         75.00         0.800         1.450         1.000         1.450         237.79         204. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         229. 47           1 </td <th>e u</th> <td>- •</td> <td>òα</td> <td></td> <td>4.450</td> <td>88</td> <td>0.4.</td> <td>7 . 76</td> <td>2 6</td> <td>4 4 9 0</td> <td>Dα</td>	e u	- •	òα		4.450	88	0.4.	7 . 76	2 6	4 4 9 0	Dα
1         78.00         0.800         1.450         1.000         1.450         237.79         204.         49           18.00         0.800         1.450         1.000         1.450         237.79         204.         49           18.00         0.800         1.450         1.000         1.450         237.79         204.         49           18.00         0.800         1.450         1.000         1.450         237.79         204.         49           18.00         0.800         1.450         1.000         1.450         237.79         204.         49           19.00         0.800         1.450         1.000         1.450         237.79         204.         49           19.00         0.800         1.450         1.000         1.450         237.79         220.         47           19.00         0.800         1.450         1.000         1.450         237.79         220.         47           19.00         0.800         1.450         1.000         1.450         237.79         220.         47           19.00         0.800         1.450         1.000         1.450         237.79         220.         47           19.0	o u	-	ė		2.4	3	- 1		5	n †	10404
1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         75.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1 </td <th>3</th> <td>-</td> <td>æ</td> <td></td> <td>1.450</td> <td>8.0</td> <td>1.450</td> <td>37.7</td> <td>204</td> <td></td> <td>œ</td>	3	-	æ		1.450	8.0	1.450	37.7	204		œ
1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         75.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         239. 45           1 </td <th>핃</th> <td>-</td> <td>ω.</td> <td></td> <td>1.450</td> <td>8</td> <td>1.450</td> <td>37.7</td> <td>204</td> <td></td> <td>ထ</td>	핃	-	ω.		1.450	8	1.450	37.7	204		ထ
1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         78.00         0.800         1.450         1.000         1.450         237.79         204. 49           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1 </td <th>7</th> <td><b>-</b></td> <td></td> <td></td> <td>1.450</td> <td>8</td> <td>1.450</td> <td>37.7</td> <td>204</td> <td>9</td> <td>ထ</td>	7	<b>-</b>			1.450	8	1.450	37.7	204	9	ထ
1         78.00         0.800         1.450         1.000         1.450         237.79         204.         49           1         78.00         0.800         1.450         1.000         1.450         237.79         204.         49           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800	2E	-	8		1.450	8	4	37.7		49	œ
1         78.00         0.800         1.450         1.000         1.450         237.79         204.         49           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.         47           1         75.00         0.800         1.450         1.000         1.450         237.79         239.         45           1         72.00         0.800	MΘ	<b>-</b>	8		1.450	000.	4	37.7	204	49	æ
1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1 </td <th>36</th> <td>-</td> <td>œ</td> <td></td> <td>1.450</td> <td>- 000</td> <td>1.450</td> <td>37.7</td> <td>204</td> <td></td> <td>48402</td>	36	-	œ		1.450	- 000	1.450	37.7	204		48402
75.00         0.800         1.450         1.000         1.450         237.79         220.         47           75.00         0.800         1.450         1.000         1.450         237.79         220.         47           75.00         0.800         1.450         1.000         1.450         237.79         220.         47           75.00         0.800         1.450         1.000         1.450         237.79         220.         47           75.00         0.800         1.450         1.000         1.450         237.79         220.         47           75.00         0.800         1.450         1.000         1.450         237.79         220.         47           75.00         0.800         1.450         1.000         1.450         237.79         220.         47           75.00         0.800         1.450         1.000         1.450         237.79         220.         47           75.00         0.800         1.450         1.000         1.450         237.79         239.         45           72.00         0.800         1.450         1.000         1.450         237.79         239.         45           72.00	3		u		4 450	5	1 450	7 7	220		3.55
1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1 </td <th>ı u</th> <td>- •</td> <td>. u</td> <td></td> <td>0.14</td> <td>8 8</td> <td>4.10</td> <td></td> <td>. 000</td> <td>4.7</td> <td>3 6</td>	ı u	- •	. u		0.14	8 8	4.10		. 000	4.7	3 6
75.00         0.800         1.450         1.000         1.450         237.79         220. 47           75.00         0.800         1.450         1.000         1.450         237.79         220. 47           75.00         0.800         1.450         1.000         1.450         237.79         220. 47           75.00         0.800         1.450         1.000         1.450         237.79         220. 47           75.00         0.800         1.450         1.000         1.450         237.79         220. 47           75.00         0.800         1.450         1.000         1.450         237.79         220. 47           75.00         0.800         1.450         1.000         1.450         237.79         220. 47           75.00         0.800         1.450         1.000         1.450         237.79         220. 47           72.00         0.800         1.450         1.000         1.450         237.79         239. 45           72.00         0.800         1.450         1.000         1.450         237.79         239. 45           72.00         0.800         1.450         1.000         1.450         237.79         239. 45           72.00	3 2	- •			7	8 8	7		000		2 2 2
1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1 </td <th># L</th> <td></td> <td>, ,</td> <td></td> <td></td> <td>38</td> <td>4 4</td> <td></td> <td>330</td> <td>, 7</td> <td>3 6</td>	# L		, ,			38	4 4		330	, 7	3 6
1         75.00         0.800         1.450         1.000         1.450         237.79         220.47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.47           1         72.00         0.800         1.450         1.000         1.450         237.79         239.45           1         72.00         0.800         1.450         1.000         1.450         237.79         239.45           1         72.00         0.800         1.450         1.000         1.450         237.79         239.45           1         72.00         0.800         1.450         1.000         1.450         237.79         239.45           1	1 0	- •			0.0	38	7			- 1	2 0
1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.77         239. 45           1 </td <th># E</th> <td></td> <td>. ייי</td> <td></td> <td>1.450</td> <td>88</td> <td>1.450</td> <td>37.7</td> <td>220</td> <td>74</td> <td>3.6</td>	# E		. ייי		1.450	88	1.450	37.7	220	74	3.6
1         75.00         0.800         1.450         1.000         1.450         237.79         220.47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.47           72.00         0.800         1.450         1.000         1.450         237.79         239.45           72.00         0.800         1.450         1.000         1.450         237.79         239.45           72.00         0.800         1.450         1.000         1.450         237.79         239.45           72.00         0.800         1.450         1.000         1.450         237.79         239.45           72.00         0.800         1.450         1.000         1.450         237.79         239.45           72.00         0.800         1.450         1.000         1.450         237.79         239.45           72.00         0.800         1.450         1.000         1.450         237.77	3	•	и		7	5	450	7 70	0,0	7.9	,
1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         75.00         0.800         1.450         1.000         1.450         237.79         220. 47           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.77         239. 45           1 </td <th></th> <td></td> <td>. u</td> <td></td> <td></td> <td>38</td> <td></td> <td>. 46</td> <td></td> <td>- 1</td> <td>200</td>			. u			38		. 46		- 1	200
1         75.00         0.800         1.450         1.000         1.450         237.73         220.47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.47           1         75.00         0.800         1.450         1.000         1.450         237.79         220.47           1         72.00         0.800         1.450         1.000         1.450         237.79         239.45           1         72.00         0.800         1.450         1.000         1.450         237.79         239.45           1         72.00         0.800         1.450         1.000         1.450         237.79         239.45           1         72.00         0.800         1.450         1.000         1.450         237.79         239.45           1         72.00         0.800         1.450         1.000         1.450         237.79         239.45           1         72.00         0.800         1.450         1.000         1.450         237.77         239.45           1         72.00         0.800         1.450         1.000         1.450         237.77         239.45           1	<u>.</u>	- ,	o r		,	38	000	- 1		• •	2 0
75.00   0.800   1.450   1.000   1.450   237.79   220. 47     75.00   0.800   1.450   1.000   1.450   237.79   220. 47     75.00   0.800   1.450   1.000   1.450   237.79   229. 45     72.00   0.800   1.450   1.000   1.450   237.79   239. 45     72.00   0.800   1.450   1.000   1.450   237.79   239. 45     72.00   0.800   1.450   1.000   1.450   237.79   239. 45     72.00   0.800   1.450   1.000   1.450   237.79   239. 45     72.00   0.800   1.450   1.000   1.450   237.79   239. 45     72.00   0.800   1.450   1.000   1.450   237.77   239. 45     72.00   0.800   1.450   1.000	# L	- •	, D		,	3 8	000			. 1	3 5
1   75.00   0.800   1.450   1.000   1.450   237.79   220. 47     1   75.00   0.800   1.450   1.000   1.450   237.79   220. 47     1   72.00   0.800   1.450   1.000   1.450   237.79   239. 45     1   72.00   0.800   1.450   1.000   1.450   237.79   239. 45     1   72.00   0.800   1.450   1.000   1.450   237.79   239. 45     1   72.00   0.800   1.450   1.000   1.450   237.79   239. 45     1   72.00   0.800   1.450   1.000   1.450   237.79   239. 45     1   72.00   0.800   1.450   1.000   1.450   237.77   239. 45     1   72.00   0.800   1.450   1.000   1.450   237.77   239. 45     1   72.00   0.800   1.450   1.000   1.450   237.77   239. 45     1   72.00   0.800   1.450   1.000   1.450   237.77   239. 45     1   72.00   0.800   1.450   1.000   1.450   237.77   239. 45     1   72.00   0.800   1.450   1.000   1.450   237.77   239. 45     1   72.00   0.800   1.450   1.000   1.450   237.77   239. 45     1   72.00   0.800   1.450   1.000   1.450   237.77   239. 45     1   72.00   0.800   1.450   1.000   1.450   237.77   239. 45     1   72.00   7.000	u 3		, L		004.	38	000		0 0	7 7	3 5
1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.77         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.77         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.77         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.77         239. 45	36		חור.		1.450	88	1.450	37.7	220.	47	33
1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.77         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.77         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.77         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.77         239. 45							!			!	•
1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.77         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.77         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45           1         72.00         0.800         1.450         1.000         1.450         237.79         239. 45	Z !		'n,		4.	000	1.450	37.7	238	ა ა	56805.
1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.77 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.77 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.77 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45	S.	-	'n		4.	96.	1.450		239	գ , Ծ (	56805
1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45	- ;	-			4.	000	1.450	7. 1	238	4 . Մ ք	56805
1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.73 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45	# T	_			4.	3	7.400	· ·	733	n .	0000
1 72.00 0.800 1.450 1.000 1.450 237.73 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.73 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.73 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45	7	_			4	3	1.450		7.28	4 4 U T	0000
1 72.00 0.800 1.450 1.000 1.450 237.73 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45	m ·	-	'n.		۲.	3	1.450	· · ·	239	4 . U i	26903
1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45	z c		oi o		Ψ,	88	1.450	7.75	238	ช 4 ช ศ	56805
1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 5 1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 5	ŝ	-	'n		. 4 . C	3			733	n f	
1 72.00 0.800 1.450 1.000 1.450 237.79 239. 45 5	Ž	-	ď		4	1.000	45	37.7	3		56805
	15	-	ď		4		č.	37.7	9		56805

MSF PILE LOADING CAPACITIES (P ULTIMATE)
NAVAL SUBMARINE BASE, BANGOR, WA AUGUST 1984

BENT	PILE	ITP	LENGTH FT	EFF-L FACTOR	ORG-DIA FT	EFF-ARA Factor	EFF-DIA FT	EFF-ARA	CC	۲/۵۶	P-ULT
				•				!	)		2
	-	-	72.00	0.800	1.450	- 000	1.450		239.	45	56805.
	¥.	-	2.00		1.450	.00			239	45	56805
	5E	-	72.00	0.800	1.450	- 000	1.450	237.79	239.	45	56805.
	m	-	72.00		1.450	<del>-</del>			239.	45	56805
	E S		72.00		1.450	8			239.	45	56805
	Š	-	8.8		1.450	8 -	1.450		239.	45	56805.
EAS	PIER										
40E	-	-	63.00	0.800	1.330	- 000	1,330	200.06	263.	43	52517.
	2E	-	63.00	0.800	1.330	- 000	•	200.06	263	43	52517.
	<b>≯</b> (		63.00	0.800	1.330	88	1.330	200.06	263.	43	52517.
	,	-	3.3		7.330	3	1.330	200.06	263.	£	52517.
416	-	-	63.00	0	1.330	÷.000	1.330	200.06	263.	43	52517.
	3E	-	63.00	0	1.330	1.000	1.330		263.	43	52517.
	7,	-	63.00	0.800	1.330	1.000	1.330	200.06	263.	43	52517.
	e	-	63.00	0	1.330	- 000 -	1.330	200.06	263.	43	52517.
44E	-	-	63,00	o	1,330	000	1.330		263	43	52517
	2E	-	63.00	0.800	1.330	1,000	1 330	200	263	43	52517
	7	-	63.00	0.800	1.330	000	1.330		263	6.4	52517
	m	-	63.8	0.800	1.330	000	1,330	200.06	263.	43	52517.
į		•	0	0						;	1
10	- 2	- •	38		0.55	38	0.60	200.06	263		52517.
	13		3 8	8 8	000	88	000	86.6	502	4 ¢	52517
	່ເຕ		63.00	808	1.330	88	1,330		263	າ 4 ລິດ	52517
			•							}	
48E	- ;	-	64.00	0.800	1.420	<del>1</del> .000	1.420	228.05	290		66126.
	2E	٠,	64.00	0.800	1.420	000.	1.420	228.05	290	-	66126.
	* C		8 8	900	4.420	8 8	420	228.05 228.05	290.	+ 4	66126.
					)	) )					
49E	-	-	64.00	0.800	1.420	<del>1</del> .000	1.420	228.05	290.	1	66126.
	2E	-	64.00		1.420	- 000	1.420	228.05	290	4 4	66126.
	*		64.00	0.800	1.420	00.	1.420	228.05	290.	<del>4</del>	66126.
	7)	-	64.00	0.800	1.420	- 000	1.420	228.05	290.	4	66126
52E	-	-	65.00	0.800	1.420	-000	1.420	228.05	281	4	64107
	<b>3</b> E	-	65.00	0.800	1,420	1.000	1.420	228.05	281.	4	64107
	<b>5</b>	-	65.00	0.800	1.420	1.000	1.420	228.03	281.	41	64107
	60	-	65.00	0.800	1.420	-000	1.420	228.03	281.	4	64107
535	-	-	65.00	0.800	1.420	1,000	1.420	228 05	28.1	41	64107
	2E	-	65.00	0.80	1.420	000	1.420	228.05		- 1-	64107
	5₩	-	65.00	0.800	1.420	- 000	1.420	228.05	281	4 4	64107
	m	-	65.00	0.800	1.420	<del>1</del> .000	1.420	228.05	281.	4	64107.
396	-	-	66.00	0.800	1.420	1.000	1.420	228.05	273.	42	62179.
	2E	-	99	0.800	1.420	1.000	1.420	228.05	273.	42	62179

MSF PILE LOADING CAPACITIES (P ULTIMATE)
NAVAL SUBMARINE BASE, BANGOR, WA AUGUST 1984

P-ULT LB	62179.	62179. 62179. 62179. 62179. 62179.		69698 69698 69698 69698	74194. 74194. 74194. 74194. 74194.	79139. 79139. 79139. 79139. 79139.	79139. 79139. 79139. 79139. 79139.	79139. 79139. 79139. 79139. 79139.
۲/۵۶	42	4 4 4 4 4 4 0 0 0 0 0 0 0	44444	4 4 4 4 4 4 0 0 0 0 0 0	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8	38 38 38 38
PSI	273.	273. 273. 273. 273.	276. 276. 276. 276. 276.	293. 293. 293. 293.	312. 312. 312. 312.	333. 333. 333.	9999. 9999. 9999.	333 333 333 333
EFF-ARA In2	228.05 228.05	228.05 228.05 228.05 228.05 228.05 228.05	237.79 237.79 237.79 237.79 237.79	237.79 237.79 237.79 237.79 237.79	237 . 79 237 . 79 237 . 79 237 . 79 237 . 79	237.79 237.79 237.79 237.79 237.79	237 . 79 237 . 79 237 . 79 237 . 79 237 . 79 237 . 79	237.79 237.79 237.79 237.79 237.79
EFF-DIA FT	1.420	1.420 1.420 1.420 1.420 1.420	1.450 1.450 1.450 1.450 1.450	1.450 1.450 1.450 1.450 1.450	1.450 1.450 1.450 1.450 1.450	1,450 1,450 1,450 1,450 1,450	4.1. 0.24.1. 0.24.1. 0.24.1. 0.24.1. 0.24.1.	1.450 1.450 1.450 1.450 1.450
EFF-ARA Factor		888888	0000000	0000000	000000000000000000000000000000000000000	0000000	8888888	888888
ORG-DIA FT	1.420	1. 420 0.44.1 0.44.1 1. 420 0.44.1	1.450 1.450 1.450 1.450 1.450	1.450 1.450 1.450 1.450 1.450	1.450 1.450 1.450 1.450 1.450	1,450 1,450 1,450 1,450 1,450	034.1. 034.1. 034.1. 034.1. 034.1. 034.1. 034.1.	1,450 1,450 1,450 1,450 1,450
EFF-L FACTOR	0.800	000000	0.000 8.000 8.000 8.000 8.000 8.000 8.000	0.00 0.80 0.80 0.00 0.80 0.00 0.00 0.00	0.0000	000000	0000000	000000000000000000000000000000000000000
LENGTH FT	66.00 66.00	86.89	67.00 67.00 67.00 67.00 67.00 67.00	65.00 65.00 65.00 65.00 65.00	6.53.00 6.53.00 6.53.00 6.53.00 6.53.00	888888 88888	88888888 8888888	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
I T			****					
PILE	3 6	16 26 36 38	3 2 K C C C C C C C C C C C C C C C C C C	3 2 2 4 A 3 3 2 E 4 A 3 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4	33 2 K E	99221 466666	33 2 KES	298 298 298
BENT		57E	60E	6 1E	64E	656	68E	969 F

MSF PILE LOADING CAPACITIES (P ULTIMATE)
NAVAL SUBMARINE BASE, BANGOR, WA AUGUST 1984

P-ULT LB	79139. 79139.
۲/۵۶	38
_	333.
FFF-ARA	237.79 237.79
EFF-01A	1.450
EFF-ARA FACTOR	
ORG-DI	1.450
EFF-L   FACTOR	0.800
LENGTH	61.00
ITP	
BENT PILE	NE S

End of file on DATO2 causes a return to MTS. Execution terminated 13:15:26 T=0.502 RC=0 \$1.20

\$516

TABLE 4

COLUMN LOAD CAPACITY CALCULATIONS

1980 INSPECTION

T-19

۱,\* \*

.

# MAGNETIC SILENCING FACILITY FILE LOADING CAPACITIES NAVAL SUBMERINE BASE. THIDENT SUPPORT SITE EANGOR MASHINGTON NOVERBER 18, 1908 -1

,	BENT	PILE	175	LENGTH FT	EFF-L Factor		EFF-ARA Factor	EFF-DIA FT	EFF-ARA INZ	C PSI	L/D	P-ULT LB
	APPROAC	HGAY PI	LR6									
	1	1	1	34.86	2.893	ē.92ē	1.292	6.926	95.73	549.	ĴĒ	52566.
		2E	1	34.2€	ହି.ନିହିନ୍ତି	ê.92¢	1.999	0.72∂	95.73	549.	30	52566.
		214	i	34.₽₽	9.899	8.928	1.999	B.92B	<del>75.73</del>	549.	34	52566.
		3	i	34.22	£.8££	6.920	1.666	6.926	95.73	547.	39	52566.
	ĩ	iN	1	34.69	938.8	€.929	1.888	0.729	95.73	549.	36	52566.
		15	1	34.00	0.360	ê.72ĕ	1.666	₹.920	95.73	549.	3₽	52566.
		2E	i	34.63	6.866	g.929	1.222	₹.72₽	95.73	549.	36	52566.
		ZW	i	34.60	ê.859	ē.922	1.089	₽.72₽	95.73	549.	39	52566.
•		38	1	34.07	6.869	9.929	1.999	€.92€	95.73	549.	39	52566.
		33	ì	34.39	<b>6.866</b>	Ø.920	i.999	<b>0.92</b> 0	95.73	549.	3 <b>5</b>	52566.
	3	i	i	36.66	6.866	9.928	1.003	B.92B	95.73	495.	31	4£238.
		25	1	35.66	9.899	<b>0.</b> 920	1.533	ē.928	95.73	490.	31	46838.
t		ŹW	i	36.99	6.869	0.920	1.929	0.920	95.73	498.	31	4:339.
		3	i	36.69	ଡିଡିଟି.ଡି	g.919	1.999	6.929	<sup>9</sup> 5.73	499.	31	46888.
	4	i	1	37.66	Ø.859	Ø.928	1.535	Ø.92 <b>9</b>	95.73	454.	32	44388.
		<u> 25</u>	ì	37.00	9.899	6.920	1.939	₹.920	95.73	£5.4	32	44338.
		29	i	37.65	<b>988.9</b>	Ø.928	1.666	₽.72₽	95.73	464.	32	44388.
		3	i	37.90	€.8€9	₽.938	1.739	8.83 <i>8</i>	77.91	377.	38	294£5.
	i	1#	1	39.00	8.878	<b>4.</b> 924	1.552	ê.925	95.73	417.	34	39953.
		:3	ì	39.60	8.898	1.777	1.989	1.529	113.19	<b>4</b> 93.	31	55768.
		Œ	I	39.₽€	$\tilde{s}.8\tilde{s}\tilde{s}$	1.799	1.626	1.963	113.19	493.	31	55768.
		24	1	39.53	8.897	1.663	1.666	1.838	113.18	493.	31	55768.
		33	1	39.90	P.300	1.823	1.669	1.856	113.19	493,	3,	55768.
		33	1	39.00	Ø.850	1.693	1.989	1.692	113.19	493.	31	55768.
		1	i	39.66	6.856	1.622	i.ggg	1.883	113.16	493,	31	55768.
		Œ	î	39.00	₿.66€	1,546	1.027	1.839	113.15	493.	31	557 <b>6</b> 8.
*		24	5	39. <i>00</i>	6.693	1 <b>.7</b> 68	1.000	1.fff	113.15	473.	31	55768.
		3	į	39.69	6.866	1.638	1.698	1.668	113.19	493.	31	55768.
,	ii	i	1	39.20	<b>e</b> .369	1.868	i.ggg	1.239	131.92	575.	29	75372.
		Œ	1	39.00	£.8£3	1.679	ા જુજુ ક	1.290	113.10	493.	31	55768.
		20	ì	39.22	9.862	1.838	1.699	1.980	113.16	493.	31	55768.
	,	3	1	39.FF	ê.89ê	1.868	1.639	1.020	113.19	473.	31	55788.
	:	15	1	39. <i>05</i>	<b>9.8</b> £3	1.628	1.823	i.029	113.10	493.	31	55768.
	•	13	1	39.66	£.399	1.668	1.283	1.528	113.19	493.	31	55768.
,	1	žΞ	i	39.00	9.896	1.639	1.629	1.882	113.10	493.	31	55768.
	ł	Z#	1	39.00	ø.503	1.032	1.900	1.888	113.is	433.	31	557.8.
		34	1	39.60	8.888	1.933	1.595	1.839	131.92	575.	29	75872.
	_	35	ì	39.00	8.883	1.636	1.000	1.636	131.92	575.	29	75372.
	1											

MAGNETIC SILENCING FACILITY PILE LOADING CAPACITIES NAVAL SUBMARINE BASE, TRIBENT SUPPORT SITE FANCON WASHINSTON NOVEMBER 18, 1980 -1

BENT	FILE	ITP	LENGTH	FFF-	GRG-DIA	EFF-ARA	EFF-DIA	EFF-ARA	£	L/D	P-ULT
Delet	,	•	FT	FACTOR		FACTOR	Fī	INZ	PSI		LB
			•								
15	1	1	37.9°	\$.8££	1.õrõ	1.600	1.663	113.10	548.	36	6196£.
	篮	1	37.00	6.863	1.668	1.000	1.009	113.10	543.	3₽	6196 <b>2</b> .
	20	1	37.₽0	₽.899	1.668	1.666	1.992	113.15	546.	39	61969.
	3	i	37.68	6.862	1.583	1.299	1.686	131.92	539.	27	84295.
	٠	•	3,102	0		••••		*****			
,	i	1	36.00	6.366	1.089	1.269	1.686	131.92	675.	27	89044.
	25	1	35.62	ø.89₽	1.999	1.690	1,938	113.19	579.	27	65450.
	24	i	36.99	<b>5.888</b>	1.639	1.030	1.989	131.92	675.	27	89844.
	3	i	36.66	€.85€	1.000	1.079	1.666	113.13	579.	29	6545€.
								000 55			44.477
19	ì	1	45.66	9.856	1.420	1.676	1.429	228.95	705.	25	169775.
	25	1	45.00	9.399	1.339	1.699	1.338	200.00	<b>655.</b>	27	131068.
	Z#	1	45.99	6.896	1.686	1.ଡିଡିଡି	1.683	131.92	432.	<b>3</b> 3	56988.
	3	i	45.00	9.866	1.259	j.666	1.250	176.71	579.	29	102265.
3	1	i	46.68	g.866	1.339	1.888	1.338	200.55	<i>6</i> 27.	23	125431.
e	2E	1	46.62	8.888	1.259	1.556	1.250	176.71	554.	29	97857.
	77 77		45.80	Ø.866	1.259	1.668	1.258	176.71	554.		978£7.
		i			1.250	1.669	1.259	176.71	554.	29	97867.
	3	1	46.69	Ø.8 <b>23</b>	1.235	1.665	1.235	1/0./1	JJ4.	LI	1/00/.
23	1	i	52.88	6.884	1.250	1.658	1.259	176.71	433.	33	76586.
•	7=	1	52.99	ø.88€	1.33€	1.660	1.336	298.88	471.	31	98155.
	Ξ.	1 .		585.0	1.338	1.568	1.339	200.00	491.	31	93155.
	3	i	52.00	£.88£	1.339	1.666	1.335	200.00	491.	31	93155.
	•	•				••••					
4	:	1	53.96	g.893	1.330	1.225	1.339	289.85	472.	32	94486.
		1	53.##	6.863	1.500	1.595	1.599	254.47	651.	28	152872.
	22	1	53.66	9.899	1.339	1.200	1.330	208.05	472.	32	94485.
	3	!	53 <b>.8</b> 2	₹.8€₹	1.339	1.066	1.33€	200.06	472.	32	94486.
									• • • •	•	
27	ä	1	56.42	Ø.898	1.336	1.629	1.339	200.06	423.	34	84634.
	13	!	56.23	F.822	1.590	1.000	1.500	254.47	533.	38	136931.
	ΞΞ	i	55. <b>69</b>	9.8ff	1.500	1.778	1.599	254.47	538.	30	135931.
	14	i	55.69	8.899	1.500	1.666	1.525	254.47	533.	39	136931.
	14	i	56.69	818.8	1.500	1.066	1.500	254.47	533.	39	136931.
	33	i	56,99	6.86€	1.569	i.Švē	1.500	254.47	538.	3₿	135931.
-9	1	1	58.88	6.888	1.339	1.682	1.333	200.05	394.	35	78398.
•	ż	1	58 <b>.69</b>	9.866	1.339	1,839	1.339	200.05	394.	35	78898.
					1.330	1.000	1.338	200.00	394.	35	78898.
	23	i	58.00	3.869			1.568				
i	3	i	56.09	9.866	1.596	ો . જેજેજે	1.555	254.47	592.	31	127651.
Ì											
EADER I	PIER										
3€	:	i	59.68	୭.୫୧୫	1.426	1.939	1.426	228.95	434.	33	99875.
CL				₽.866	1.428	1.999	1.424	228.85	434.	33	99875.
-	23	1	57.83							33	99075.
	23	i	59.69	9.899 2.522	1.426	1.500	1.420	228.25	434.		
=	3	1	59.00	9.566	1.420	1.073	1.426	<b>228.9</b> 5	434.	33	99275.

T-21

# NAGNETIC SILENCING FACILITY PILE LONDING CAPACITIES NAVAL SUPHARINE BASE: TRIBENT SUPPORT SITE BANGOR WASHINGTON NOVEMBER 18, 1988

	; - iī	PILE	179	LENGTH FT	EFF-L FACTOR	ORG-BIA FT	EFF-ARA FACTOR	EFF-DIA FT	EFF-ARA IN2	C PS1	L/Ū	P-ULT Lb
		ΞE	1	96.55	8.8££	1.599	1.628	1.588	254.47	387.	35	985 <b>3</b> 0.
		1.	i	66.65	ହି.ଞିଜି	1.599	1.000	1.520	254.47	337.	35	98580.
		24	1	66.88	6.866	1.420	1.669	1.429	223.95	347.	37	79173.
		25	1	66.8€	6.869	1.426	1.222	1.420	228.65	347.	37	79173.
		35	1	66.88	2.892	1.420	1.239	1.420	228.95	347.	37	79173.
		34	1	66.66	6.886	1.420	1.663	1.429	228.05	347.	37	79173.
	į	I	1	66.22	8.899	1.250	1.606	1.250	176.71	269.	42	47541.
		23	1	66.23	¥.899	1.500	1.000	1.599	254.47	337.	35	9858 <b>0.</b>
		23	1	66.66	Ø.860	1.338	1.000	1.336	200.05	395.	40	60930.
		3	1	66.83	9.899	1.259	1.666	1.259	176.71	269.	42	47541.
	25	:ξ	1	66.93	Ø.866	1,250	1.000	1.25€	176.71	269.	42	47541.
		:E	i	66.88	9.899	1.428	1.999	1.420	228.95	347.	37	79173.
		7N	1	66.88	6.899	1.333	1.669	1.339	299. <b>9</b> 5	305.	46	6 <b>0</b> 930.
		23	i	66.69	Ø.366	1.336	1.666	1.330	200.00	305.	49	60730.
		ΞΞ.	1	66.69	9.899	1.338	1.000	1.33%	200.06	395.	46	6293V.
		ŝ¥	i	68.89	<b>9.</b> 899	1.339	1.999	1.330	200.06	305.	4.F	6073B.
i	ST PI	EF.										
	37 <b>₩</b>	i	i	72.44	£.899	1.426	1.666	1.428	228.95	292.	41	66528.
	•	C¥	i	72.00	6.898	1.588	1.999	1.586	282.34	361.	36	1#1971.
		2E	1	72.20	9.899	1.420	1.696	1.426	228.65	272.	41	66528.
		3	ì	71.99	§.€9§	1.428	1.999	1.420	228.95	399.	49	68415.
	38¥	Ţ	1	73.22	6.866	1.429	1.999	1.426	228.65	284.	41	64717.
		29	i	73.60	6.899	1.58£	1.464	1.589	282.34	351.	37	99196.
		2E	i	73.69	ઈ.86€	1.426	1.222	1.426	228.95	284.	41	64717.
		3	i	73.20	6.866	1.420	1.588	1.42£	229.95	294.	41	64717.
	48X	19	i	71.00	985.8	1.426	1.526	1.420	223.85	388.	46	68415.
		1E	1	71.66	6.820	1.42€	1.669	1.429	228.95	329.	48	68415.
		28	i	71.00	õ.86£	1.429	i.õõé	1.422	228.65	356.	46	69415.
		25	i	71.00	<b>୭.</b> ୫୫୫	1.428	1.666	1.426	228.65	366.	45	68415.
		: <b>x</b>	i	71.00	<b>ଡି.</b> ଚିହିତି	1.420	1.676	1.420	228.65	39€.	÷£	68415.
		3E	i	71.99	8.888	1.420	1.273	1.429	226.∉5	388.	42	ċ8415 <b>.</b>
	42W	i	1	71.00	6.633	1.428	1.630	1.428	228.85	389.	ψŷ	68415.
		1N	1	71.00	9.899	1.560	1.020	1.500	254.47	335.	33	85185.
		18	i	71.20	2.866	1.589	1.666	1.566	254.47	335.	38	85185.
		ŹW	1	71.20	\$68.6	1.426	1.030	1.420	228.95	366.	48	68415.
.1		žĘ.	1	71.60	9.899	1.525	1.023	1.529	254.47	335.	33	85185.
		3	i	71.00	0.855	1.420	1.686	1.420	228.85	366.	49	63415.
1		3%	1	71.22	9.238	1.420	1.666	1.428	228.05	300.	46	69415.
I		33	1	71.00	6.869	1.426	1.020	1.420	228.55	338.	4£	63415.

# MAGNETIC SILENCING FACILITY PILE LOADING CAFACITIES NAVAL SUBMARINE BASE. TAIDENT SUPPORT SITE BANGON WASHINGTON NOVEMBER 18, 1988

POUT	F ** *	170	LENGTH	CCC_1	055_5.1A	CEE_ADA	EFF-DIA	ESELADA	С	L/D	P-ULT
BENT	FILE	ITP	FI	FACTOR	אוע־טאט FT	FACTOR	ELL-DIN	INZ	PSI	L/D	LB
43%	iΕ	1	71.99	6.866	1.330	i.õõõ	1.330	200.06	253.	43	52651.
	19	1	71.68	8.898	1.42€	1.000	1.422	228.65	3ĉ∂.	43	68415.
	2E	1	71.99	6.862	1.596	1.666	1.5ชิชิ	254.47	335.	38	85185.
	22	1	71.69	ø.36€	1.338	i.õõõ	1.339	200.06	263.	43	52651.
	Œ	1	71.69	6.866	1.420	1.699	1.420	228.95	3₽€.	49	68415.
	33	1	71.00	9.869	1.580	i.êêê	1.586	282.34	371.	36	194864.
46W	1	1	76.88	9.869	1.420	1.666	1.420	228.65	262.	43	59797.
	iñ	1	75.££	6.869	1.429	1.666	1.429	228.25	262.	43	59709.
	iS	i	76.22	ø.899	1.428	1.629	1.429	228.05	262.	43	59709.
	2E	i	75.89	6.899	1.5ff	1.692	1.500	254.47	366	42	76341.
	2W	i	75.00	9.856	1.339	1.000	1.330	200.06	236.	45	47184.
	3	1	75.60	8.838	1.566	1.666	1.566	254.47	300.	46	76341.
	34	i	73.66	8.868	1.590	1.003	1.500	254.47	317.	39	88581.
	33	1	73. <del>92</del>	f.863	1.599	1.668	1.500	254.47	317.	39	80581.
47¥	1E	i	76.88	9.829	1.500	1.888	1.599	254.47	292.	41	74345.
7/#	17	i	76.88	6.866	1.420	1.629	1.420	228.85	262.	43	59709.
	2E	1	75.59	£.856	1.420	1.969	1.429	228.85	269.	42	61312.
	24	1	75.00	9.862	1.500	1.665	1.500	254.47	366.	48	76341.
	35	i	74.93	₽.25£	1.500	1.000	1.588	254.47	398.	39	78418.
	3¥	i	74.89	6.666	1.580	1.668	1.566	254.47	368.	39	78418.
58¥	i	i	79.93	f.Sff	1.566	1.838	1.566	254.47	278.	42	68866
	in	1	79.00	g.226	1.42€	1.669	1.429	228.05	242.	45	55260.
	13	i	79.88	0.889	1.429	1.989	1.420	228.95	242.	45	55269.
	2E	1	77.22	€.895	1.428	1.569	1.428	228.05	255.	43	58168.
	24	1	77.83	£.89£	1.500	1.696	1.589	254.47	285.	41	72426.
	3	1	77.00	6.86.3	1.420	1.228	1.429	228.65	255.	43	58168.
	38	I	75.99	ø.86€	1.420	1.690	1.420	228.05	269.	42	61312.
	39	1	75.88	g.889	1.423	1.625	1.429	228.05	269.	42	61312.
51%	1E	1	89.46	ø.866	1.428	1.626	1.420	228.05	236.	45	53887.
	14	1	83.69	8.368	1.589	1.666	1.589	232.34	293.	41	82596.
	2E	i	77.29	2.822	1.426	9.595	6.199	1.14	i.	613	i.
	ŹW	1	77.23	ø.900	1.589	1.098	1.580	282.34	316.	39	89158.
	3E	i	75.29	0.863	1.426	1.656	1.420	228.25	269.	42	61312.
	39	1	75.₹₹	9.869	1.420	1.666	1.420	228 <b>.6</b> 5	259.	42	61312.
549	1N	i	88.69	ø.90ø	1.500	1.268	1.589	254.47	2ċ4.	43	67896.
	15	i	29.00	ø.9£8	1.500	1.666	1.500	254.47	264.	43	67396.
	ΞĒ	i	50.00	3.863	1.599	1.823	1.522	254.47	264.	43	67896.
)	11	i	89.66	9.368	1.588	1.630	1.520	254.47	264.	43	57£96.
_	žĒ	i	75.52	8.883	1.420	1.663	1.426	223.85	262.	43	59709.
	ZH	1	76.22	8.888	1.420	1.688	1.426	223.65	262.	43	59709.
l	38	i	74.20	0.866	1.500	1.000	1.509	254.47	398.	39	78418.
	38	i	74.65	€.86€	1.599	1.030	1.500	254.47	368.	39	78418.
1	33	i	74.68	9.869	1.426	1.600	1.428	228.65	276.	42	62935.
	35	i	74.66	8.863	1.589	1.92ê	1.588	254.47	308.	39	78418.

# MAGNETIC SILENCING FACILITY PILE LOADING CAPACITIES NAVAL SUBMARINE BASE. TRIBENT SUPPORT SITE BANGOR WASHINGTON NOVERBER 18, 1988

BENT	FILE	itp	LENGTH FT	EFF-L Factor	ORG-DIA FT	EFF-ARA FACTOR	EFF-DIA FT	EFF-ARA INZ	C L/D PS1	P-ULT LB
554	18 28 28 38 38	1 1 1 1 1	89.00 80.00 77.00 77.00 75.00 75.00	668.6 688.6 688.6 668.6 668.6	1.500 1.500 1.500 1.500 1.500 1.500	1.698 1.696 1.696 1.698 1.698	1.506 1.506 1.506 1.500 1.500	254.47 254.47 254.47 254.47 262.34 228.65	264. 43 264. 43 235. 41 285. 41 333. 38 269. 42	67896. 67896. 72426. 72426. 93976. 61312.
58W	1 18 15 22 28 3 38 38	1 1 1 1 1 1	80.00 80.00 78.00 78.00 78.00 75.00 75.00	6.26.6 6.26.6 6.26.6 6.26.6 6.26.6 6.26.6 6.26.6	1.588 1.589 1.599 1.428 1.599 1.598 1.586			254.47 282.34	293. 41 293. 41 277. 42 249. 44 277. 42 388. 48 333. 38 388. 42	82576. 82596. 78581. 56686. 78581. 76341. 92976. 76341.
578	1E 14 2E 24 3E 34	1 1 1 1 1 1	79.00 79.00 77.00 77.00 76.00 76.00	298.0 298.0 208.0 208.0 208.0	1.563 1.563 1.563 1.428	1.688. 1.668. 1.668 1.668	1.500 1.500 1.500 1.420	254.47 254.47 254.47 228.05	242. 45 270. 42 285. 43 285. 41 262. 43 230. 46	55260. 60006. 72426. 72426. 59709. 45951.
62¥	1 IN IS 2E 24 3 3H 39	1 1 1 1 1 1 1 1	78.00 78.00 78.00 77.00 77.00 76.00 76.00	9.869.9 9.869.9 9.869.9 9.869.9 9.869.9	1.420 1.420 1.420 1.420 1.500 1.500	1.656 1.656 1.656 1.656 1.656	1.428 1.428 1.428 1.428 1.588	228.05 228.05 228.05 228.05 228.05 254.47	277. 42 249. 44 249. 44 255. 43 255. 43 292. 41 292. 41 262. 43	76581. 56686. 56686. 58168. 58168. 74345. 74345. 59789.
63#	18 28 28 38 38	1 1 1	79.00 77.03 75.00 75.00 74.00	5.859 6.859 6.859	1.589 1.589 1.589 1.389	1.669 1.669 1.669 1.669	1.500 1.500 1.500 1.500 1.330	5 254.47 5 254.47 3 254.47 3 220.66	249. 44 285. 41 306. 46 306. 40 242. 45 276. 42	56686. 72426. 76341. 76341. 43468. 62990.
58 <b>4</b>	1 1N 15 2E 2W 3 3N 35	1 1 1 1 1 1	73.09 73.09 73.00 72.00 72.00 71.00 71.00	6.38 6.82 6.85 6.86 6.88	8 1.42 8 1.42 8 1.53 9 1.75 9 1.55 8 1.55	5 1.66 5 1.66 6 1.66 6 1.66 8 1.66 5 1.66	7 1.42 7 1.42 7 1.53 7 1.75 8 1.56 9 1.56	228.05 228.05 282.34 346.36 254.47 254.47	317. 39 294. 41 264. 41 361. 36 443. 33 335. 38 335. 38 263. 43	89581. 64717. 64717. 181971. 153462. 85185. 85185. 52651.

# #AGNETIC SILENCING FACILITY PILE LCADING CAPACITIES NAVAL SUBMARINE BASE, TRIDENT SUPPORT SITE BANGOR MAGMINGTON NOVEMBER 18, 1980 -1

PENT	PILE	178	LENGTH	EFF-L	GRG-DIA	EFF-ARA	EFF-DIA	EFF-ARA	3	L/D	P-ULT
	• • •	•	FT	FACTOR	FT		FT	1N2	PSI		ĹĒ
67W	15	1	73. <b>88</b>	2.833	1.588	1.666	1.588	282.34	351.	37	99196.
	14	ì	73.00	6.898	1.420	1.000	1.420	22 <b>8.9</b> 5	284.	41	64717.
	ŹΞ	i	72.29	ø.895	1.566	1.229	1.500	254.47	326.		82835.
	î.	1	72.97	8.888	1.420	1.666	1.428	228.65	292.		66528 <b>.</b>
	3	1	71.22	8.500	1.589	1.899	1.58€	282.3 <b>4</b>	371.		184864.
	35	1	71.Ýð	£.8£5	1.500	1.668	1.509	254.47	335.		85185.
	35	1	71.88	6.693	1.588	1.656	1.538	282.34	371.	35	164864.
€¥	1	i	74.56	ø.200	1.500	1.888	1.509	254.47	398.	39	78418.
5 M	15	1	74.88	5.823	1.588	1.666	1.500	254.47	368.		73418.
	1.5	1	73.88	9.889	1.520	1.626	1.596	254.47	317.		8 <b>2581.</b>
	2£	1	72.66	8.888	1.566	1.569	1.569	254.47	326.		82835.
	24	i	72.22	9.899	1.580	1.666	1.589	292.34	361.		101971.
	24	1	72.88	<b>5.</b> 885	1.566	1.626	1.599	254.47	326.	38	82835.
	3	i	71.00	6.866	1.599	1.000	1.599	254.47	335.	38	85185.
	38	í	71.66	6.868	1.588	1.000	1.539	282.34	371.	36	184864.
	35	1	71.26	€.865	1.339	1.623	1.330	200.05	263.	43	52651.
719	15	1	74.03	₹66.3	1.426	1.666	1.426	228.95	276.	42	6298£.
	14	i	74.00	₹.899	1.429	1.999	1.420	223.95	276.	42	62980.
	Œ	1	73 <b>.</b> ££	9.899	1.425	1.023	1.420	223.95	284.	41	64717.
	29	1	73.9₽	9.866	1.428	1.666	1.420	228.05	234.	41	54717.
	3	i	71.60	9.666	1.500	1.256	1.500	254.47	335.	38	85185.
	34	i	71.68	6.866	1.599	1.608	1.500	254.47	335.	38	85185.
	33	i	71.28	938.9	1.569	1.868	1.500	254.47	335.	38	85185.
72¥	15	i	74.68	9.999	1.420	1.009	1.420	228.95	276.	42	62980.
,	17	i	74.66	6.866	1.420	1.999	1.426	228.05	276.	42	62980.
	IE.	i	73.00	9.836	1.588	1.568	1.588	254.47	317.	39	80581.
	28	1	73.00	6.862	1.428	1.622	1.429	228.85	294.	41	64717.
	3	ī	72.00	6.886	1.500	i.000	1.500	254.47	326.	33	82835.
	3%	i	72.00	9.808	1.420	1.665	1.428	228.05	292.	41	66528.
	35	i	72.69	€.85€	1.588	1.699	1.589	282.34	351.	36	161971.
73₩	:Ε	1	74.99	6.866	1.423	1.639	1.426	228.95	27£.	42	61980.
	. *	1	74.20	9.866	1.426	1.666	1.429	228.65	276.	42	62980.
	25	1	73.68	6.866	1.52€	1.669	1.5%	254.47	317.	39	8£581.
	29	1	73.66	989.9	1.429	1.668	1.429	228.65	284.	41	64717.
	3	1	72.80	Ø.809	1.569	1.695	1.569	254.47	326.	38	32835.
	334	1	72.69	636.6	1.520	1.663	1.500	254.47	326.	38	82835 <b>.</b>
	33	1	72.£2	Ø.8 <i>8</i> 9	1.599	1.666	1.500	254.47	326.	38	82635.
744	ſΕ	i	74.68	6.855	1.500	1.222	1.569	254.47	398.	39	78418.
	19	i	74.30	8.588	1.538	1.299	1.502	254.47	32∂.	39	78418.
	ĩΕ	i	73.99	Ø.655	1.588	1.638	1.568	254.47	317.	39	80581.
	27	i	73.00	8.888	1.592	1.666	1.5ชช	254.47	317.	39	86581.
	3	i	72.02	6.869	1.560	1.222	1.528	254.47	326.	39	82835.
	3%	1	72.00	ğ.8êê	1.500	1.636	1.500	254.47	326.	38	82835.
	35	i	72.28	8.866	1.500	1.223	1.588	254.47	326.	33	82335.
		•									

# MAGNETIC SILENCING FACILITY FILE LOADING CAPACITIES NAVEL SUBMARINE BASE, TRIBENT SUPPORT SITE EARLOR WASHINGTON NOVEMBER 18, 1988

:	BENT	PILE	ITP	LENGTH	EFF-L	ORG-BIA	EFF-ARA	EFF-DIA	EFF-ARA	3	L/D	P-ULT
			•	FT	FACTOR	FT	FACTOR	FT	INZ	P31		F.B
	2511			71 22	7 077	1 200	1 255	1 420	onn ar	276.	42	62980.
	75W	iΕ	1	74.68	8.888	1.429	1.000	1.426	228.65	276.	42	62788.
		18	I	74.22	6.869	1.420	1.222	1.426	228.05			
		2E	1	73.20	9.89£	1.420	1.099	1.420	228.05	284.		64717. 64717.
		24	ì	73.89	8.888	1.420	1.000	1.429	228.95	284.		
		3	1	72.60	9.899	1.506	1.000	1.500	254.47	326.		87335.
		3%	1	72.00	8.866	1.529	1.929	1.500	251.47	326.		82835. 68528.
		38	1	72.69	9.899	1.420	i.607	1.426	228.05	292.	*1	03320.
	76¥	1E	1	75.€€	£.8££	1.42ê	1.666	1.429	228.65	269.	42	61312.
		14	1	75.00	9.899	1.429	1.225	1.420	228.25	259.	42	61312.
		2E	1	74.66	9.899	1.500	1.699	1.500	254.47	303.	39	78418.
		2%	i	74.£9	9.88£	1.500	i.õõõ	1.500	254.47	303.	37	78418.
		3	1	73.90	878.8	1.580	1.625	1.580	282.34	351.	37	99196.
		3N	i	73.69	9.892	1.580	1.668	1.53€	282.34	351.	37	99196.
		33	i	73.00	8.828	1.599	i.ees	1.500	254.47	317.	39	89581.
	778	iξ	· 1	75.90	2.883	1.523	1.267	1.586	254.47	292.	41	74345.
	7.746		i	76.29	5.369	1.426	1.989	1.428	228.85	262.	43	597 <b>8</b> 9.
		19						1.588	254.47	359.	48	76341.
		2E	i	75.99	9.889	1.588	1.679			389.	49	76341.
		2.4 2.4	1	75.88	9.898	1.598	1.626	1.500	254.47			
		3	1	74.23	9.829	1.589	1.666	1.590	282.34	342.	37	98533.
		38	i	74.98	9.839	1.429	Ø.995	8.168	1.14		593	ĩ.
		33	i	74.60	6.899	1.509	0.005	g.185	1.27	Ĺ.	553	2.
:	BET PI	ER										
	42E	ΞŸ	i	63.98	998.9	1.330	1.666	1.336	200.05	334.	39	66871.
		15	i	63.29	Ø.882	1.589	1.000	1.588	254.47	425.	34	128193.
		žĖ	i	63.66	g.355	1.428	1.666	1.426	228.05	331.	35	8893.
		28	i	63.56	\$.258	1.338	1.698	1.330	268.65	334.	35	66371.
		34	ì	63.88	9.399	1.339	1.000	1.339	298.86	334.	38	66871.
		35	i	63.88	6.866	1.339	1.000	1.332	208.26	334.	33	65371.
		13	1	00.00	6.000	1.039	1.002	11005	200.20	334.	0.0	030711
	435	1	i	63.99	9.800	1.338	1.699	1.332	200.06	334.	38	66971.
		žΕ	i	ėj.Pr	Ø.899	1.42°	1.638	1.425	228.55	381.	35	85973.
		24	3	63.68	3.883	1.420	1.679	1.420	228.85	381.	35	86893.
		3	i	63.57	9.388	1.250	1.235	1.259	176.71	295.	40	52176.
	48E	19	i	63 <b>.88</b>	7.872	1.336	1.659	1.330	200 <b>.</b> 05	334.	38	66871.
	762	15	i	63.66	8.888	1.259	1.200	i.252	176.71	295.	42	52176.
		2E	i	63.88	ø.896	1.339	1.659	1.338	289.86	334.	38	66871.
		ZW	1	63.00 63.00	8.888	1.332	1.639	1.339	200.00	334.	38	65871.
1			_			1.332	1.606	1.336	199.86	334.	38	66371.
l		3N 30	i 1	63.83	8.868 8.868	1.25£	1.656	1.25%	176.71	293.	48	52176.
•		35	1	63.66	ಶ.೦೮೮	1.775	1.010	1,236	110.71	LIJ.	Τť	JL1/0.
i	47E	i	i	63.60	\$33.5	1.338	1.625	1.33€	200.06	334.	38	66871.
		îέ	1	63. <b>F</b> E	₽.88£	1.428	1.699	1.420	228.85	331.	35	86893.

# MAGNETIC SILENCING FACILITY PILE LOADING CAPACITIES NAVAL SUBMARINE BASE. TRIDENT SUPPORT SITE BANGOR MAGNINGTON NOVEMBER 18, 1988

BENT	PILE	ITP	LENGTH FT	EFF-L FACTGR	ORG-DIA FI	EFF-ARA FACTOR	EFF-DIA FT	EFF-ARA 1N2	C PSI	L/D	F-ULT LB
	24 3	1	63.88 63.88	693.6 665.6	1.679 1.539	1.929 1.929	1.670 1.500	315.42 254.47	527. 425.	32 34	166226. 1 <b>8</b> 3173.
59E	18	1	65.00	<b>3.</b> 899	1.420	1.66ê	1.425	228.95	358.	37	81628.
	13	i	65.88	3.863	1.429	1.688	1.422	228.95	358.	37	81628.
	ZE	1	65.89	398.3	1.420	1.666	1.426	226.05	358.	37	81628.
	2%	1	65.69	Ø.893	1.420	1.939	1.422	228 <b>.9</b> 5	358.	37	81629.
	34	i	65.89	ହି.୫୫.ଖ	1.335	1.666	1.33€	200.96	314.	39	62819 <b>.</b>
	33	i	65.09	6.866	1.500	1.690	1.599	254.47	399.	35	151637.
51E	1	1	65.22	ଜୁ. ଓଡ଼ନ	1.589	1.292	1.589	282.34	443.	33	125116.
	ZE	1	65.68	6.800	1.589	1.999	1.583	262.34	443.	33	125116.
	27	1	65.99	6.866	1.429	1.669	j.42 <b>£</b>	228.65	358.	37	81828.
	3	1	óć úž	9.879	1.428	1.893	1.426	228.05	347.	37	79173.
545	Ξ٩	1	65.68	9.353	1.429	1.697	1.420	228.05	347.	37	79173.
	13	1	66.66	£.899	1.330	i.888	1.330	299.96	395.	45	60930.
	ΞΞ	į	65.00	Ø.888	1.25€	1.252	i.259	176.71	269.	42	47541.
	27	i	55.££	%.8 <i>88</i>	1.330	1.688	1.332	200.06	305.	49	62939.
	35	i	65.69	2.892	1.429	1.939	1.426	228.85	347.	37	79173.
	33	i	65.00	6.888	1.588	1.629	1.538	232.34	430.	33	121354.
55)	:	i	50.88	<b>6.888</b>	1.426	1.868	i.429	228.65	347.	37	79173.
	2E	1	56.89	€.₹9€	1.330	i.ffê	1.339	200.35	305.	48	£0935.
	24	i	55.99	233.9	1.420	1.êŝē	1.428	228.25	347.	37	79173.
	3	1	65.89	808.8	1.420	1.666	1.423	223.65	347.	37	79173.
535	i	1	57 <b>.00</b>	<b>6.899</b>	1.420	1.628	1.426	228.05	337.	33	76828.
	15	1	57.99	6.899	1.428	1.652	1.426	228.05	337.	38	76329.
	18	1	o7.£8	9.822	1.429	1.050	1.426	228.85	337.	33	76828.
	25	1	67.88	6.869	1.426	1.929	1.416	223.65	337.	38	76928.
	24	i	57.9°	6.866	1.332	1.238	1.33₽	200.05	296.	46	59125.
	3	1	67.22	6.866	1.422	1.692	1.426	228.85	537.	35	76828.
	3%	i	67.00	9.863	1.426	1.625	1.426	223.65	337.	38	76828.
	35	1	67.8P	₽.88£	1.590	1.000	1.582	254 <b>.4</b> 7	376.	36	95668.
595	ΞĒ	1	67.00	6.866	1.500	1.05ê	1.563	254.47	376.	36	9566B.
	íä	1	57.2£	<b>6.</b> 889	1.252	1.666	1.250	176.71	2 <b>61.</b>	43	46132.
	ΞE	i	67.83	9.869	1.420	1.666	1.420	228.95	337.	38	76328.
	28	1	67.9€	£68	1.422	1.230	1.428	228.65	337.	33	76829.
	Œ	1	67.88	Ø.85₽	1.333	1.556	1.33€	200.06	296.	49	59125.
	34	i	67 <b>.</b> êê	698.3	1.580	1.020	1.538	782.34	417.	34	117758.
62E	2N	1	63.0r	553.6	1.330	1.069	1.330	200.05	334.	38	66871.
	<b>5</b> 3	1	63.60	935.8	1.253	1.696	1.258	176.71	295.	46	52176.
	1	i	63.22	6.863	1.339	1.692	1.336	200.86	334.	33	66871.
	IN .	!	63.60	6.866	1.428	1.020	1.426	228.65	381.	35	86893.
	13	1	63.66	3.822	1.330	1.225	1.336	200.05	334.	38	86871
	Œ	1	63 <b>.ff</b>	<b>€.</b> 89€	1.428	1.262	1.420	228.05	381.	35	86393.

MASAETIC SILENCING FACILITY PILE LOADING CAPACITIES
NAVAL SUBMARINE BASE, TRIDENT SUPPORT SITE
BANGOR MASHINGTON NOVEMBER 18, 1998
-1

BENT	FILE	116	LENGTH			EFF-ARA				L/D	P-ULT
			FT	FACTOR	FT	FACTOR	Fĭ	inz	PSI		LE
	2 !		10.22	5 024	1 228	1 222	1 225	caa ai	221	20	11071
	Žė	i	63.88	Ø.800	1.330	1.023	1.332	202.06	334.		66971.
	3	1	63.69	Ø.860	1.339	1.666	1.333	299.66	334.		66871.
	3%	1	63.52	Ø.832	1.330	1.600	1.338	200.56	334.	38	66871.
	39	1	63.89	9.866	1.429	1.668	1.429	228.65	381.	35	86893.
.3E	ΙE	1	63.00	Ø.8£6	1.420	1.992	1.420	228.65	381.	35	86893.
	. 4	1	63.00	2.852	1.330	1.999	1.339	290.96	334.	38	66871.
	ŹΞ	i	63.₽₽	Ø.866	1.330	1.299	1.339	288.86	334.	38	6£871 <b>.</b>
	24	1	63.66	9.866	1.339	1.000	1.33€	202.96	334.	38	66871.
	3E	i	£3.09	0.822	1.566	1.690	1.500	254.47	425.	34	163193.
	3¥	1	63. <b>80</b>	Ø.866	1.500	1.699	1.523	254.47	425.	34	108193.
56E	i	1	69.69	ø.866	1.330	1.866	1.339	259.95	369.	36	73725.
192	: 1N	i			1.429	1.666	1.429	228.25	420.	34	75725. 95888.
			69.99	9.899				228.95			
	13	1	68.98	Ø.899	1.426	1.696	1.425		429.	34	95888.
	2E	1	69.69	Ø.899	1.428	1.090	1.429	228.05	426.	34	95899. ***
	2¥	1	68.99	Ø.888	1.500	1.666	1.590	254.47	469.	32	119282.
	3	1	66.68	g.888	1.500	1.000	1.598	254.47	469.	32	119282.
	34	I	68.99	ø.899	1.420	1.000	1.429	228.95	429.	34	95888.
	39	i	69.69	6.883	1.589	1.999	1.58€	282.34	520.	39	146833.
.7E	iΕ	1	68.99	9.869	1.339	1.000	1.335	2 <b>99.9</b> 5	369.	36	73725.
	14	i	69.68	9.899	1.336	1.699	1.339	200.05	369.	36	73725.
	2E	1	69.60	9.892	1.339	1.009	1.339	288.86	369.	36	73725.
	2¥	i	69.22	€.8€5	1.333	1.888	1.332	200.06	359.	36	73725.
	3	1	69.69	9.899	1.530	1.669	1.589	282.34	520.	36	145838.
	38	1	69.98	Ø.80€	1.599	1.656	1.598	254.47	469.	32	119282.
	33	i	60.09	9.899	1.589	1.668	1.588	282.34	520.	32	146838.
/ <b>?</b> E	i	1	62.99	g.855	1.250	1.000	1.259	176.71	305.	49	53873.
,,,	14	i	62.99	2.82g	1.250	1.666	1.259	176.71	3£5.	49	53873.
	19	i	62.00	g.399	1.335	1.636	1.339	202.26	345.	37	69846.
	2E	1	62.88	Ø.399	1.429	1.635	1.429	228.05	393.	35	89719.
	2¥	1	62.00	0.866	1.338	1.665	1.339	202.25	345.	37	69 <b>94</b> 6.
	3	1	62.68	9.866	1.339	1.050	1.336	209.06	345.	37	69£45.
	3.	i		0.000 0.866		1.999					89719.
			62.69		1.426		1.429	228.65	393.	35	
	33	i	62.88	9.859	1.420	1.696	1.428	228.65	393.	35	89719.
ΉE	iΞ	i	62.66	6.863	1.420	1.225	1.428	228.05	393.	35	89719.
	i¥	1	62.09	ø.899	1.429	1.699	1.429	228.85	393.	35	89719.
•	ZΕ	1	62.60	9.866	1.339	1.009	1.339	lêr.ro	345.	37	69846.
	24	1	62.22	0.890	1.670	1.999	1.67€	315.42	544.	38	171631.
1	3	1	52 <b>.₽</b> 8	0.360	1.42€	1.000	1.420	228.05	393.	35	87719.
	3%	i	62.26	2.829	1.330	1.623	1.338	200.00	345.	37	69946.
	35	i	62.0∂	2.826	1.426	1.830	1.428	228.85	393.	35	89719.
∎ 72E	iΕ	1	63.69	626.0	1.420	1.666	1.429	228.85	331.	35	86893.
_	i W	1	63.65	9.868	1.428	1.029	1.428	228.95	331.	35	86893.
Ī	Œ	1	63.££	8.888	1.429	1.256	1.428		331.	35	86893.
	LE.	1	33.68	e.ore	1.760	1.000	1.725	228 <b>.£</b> 5	301.	33	60075.

# MAGNETIC SILENGING FACILITY FILE LOADING CAPACITIES NAVAL SUBMARINE BASE, TRIBENT SUPPORT SITE BANGOR WASHINGTON NOVEMBER 18, 1980 -1

Pile   Pile   File												5. 10. 7
24	BENT	PILE	ΙīΡ								L/U	
3				Fi	FAUTUR	FI	FHUIUK	rı	187	r51		LF
3		74	1	43.46	Ø. 838	1.474	1 444	1.478	228.45	381.	35	86893.
1												
1												
Time												
12		••	•									
1	73E	iξ	1	63.99	9.899	1.500	1.635	1.500	254.47	425.		103193.
1		12	i	63.66	933.g	1.420	1.666	1.420	228.95	381.		86893.
3		2E	i	63.89	9.899	1.330	1.999	1.336	200.06	334.	38	£5371.
3 1 63.68 6.868 1.426 1.666 1.336 1.666 228.65 381. 35 86673. 38 1 63.66 6.868 1.336 1.666 1.426 228.65 381. 35 86873. 38 1 63.66 6.866 1.426 1.666 1.426 228.65 381. 35 86873.  74E IE 1 63.66 6.866 1.336 1.666 1.330 266.66 334. 38 66571. 1W 1 63.66 6.866 1.336 1.666 1.330 266.66 334. 38 66571. 2E 1 63.66 6.866 1.336 1.666 1.330 266.66 334. 38 66571. 2W 1 63.66 6.866 1.336 1.666 1.336 266.66 334. 38 66571. 3 1 63.63 6.866 1.336 1.666 1.336 266.66 334. 38 66571. 3 1 63.63 6.866 1.336 1.666 1.336 266.66 334. 38 66571. 3 1 63.66 6.866 1.336 1.666 1.336 266.66 334. 38 66571. 3 1 63.66 6.866 1.336 1.666 1.336 266.66 334. 38 66571. 3 1 63.66 6.866 1.336 1.666 1.336 266.66 334. 38 66571. 3 1 63.66 6.866 1.336 1.666 1.336 266.66 334. 38 66571. 3 1 63.66 6.866 1.566 1.666 1.336 266.66 334. 38 66571. 3 1 63.66 6.866 1.566 1.666 1.566 3.36 266.66 334. 38 66571. 3 1 63.66 6.866 1.566 1.666 3.566 254.47 425. 34 168193.  75E IE 1 63.66 6.866 1.426 1.666 1.426 228.65 381. 35 86893. 2E 1 63.66 6.866 1.426 1.666 1.426 228.65 381. 35 86893. 2E 1 63.66 6.866 1.426 1.666 1.676 315.42 527. 36 16626. 3 1 63.66 6.866 1.426 1.666 1.676 315.42 527. 36 16626. 3 1 63.66 6.866 1.426 1.666 1.676 315.42 527. 36 16626. 3 1 63.66 6.866 1.426 1.666 1.426 228.65 381. 35 86893. 35 1 63.66 6.866 1.426 1.666 1.426 228.65 381. 35 86893. 35 1 63.66 6.866 1.426 1.666 1.426 228.65 381. 35 86893. 35 1 63.66 6.866 1.426 1.666 1.426 228.65 381. 35 86893. 36 1 64.66 6.866 1.426 1.666 1.426 228.65 369. 36 84199. 21 1 64.66 6.866 1.426 1.666 1.426 228.65 369. 36 84199. 31 1 64.66 6.866 1.426 1.666 1.426 228.65 369. 36 84199. 32 1 64.66 6.866 1.426 1.666 1.426 228.65 369. 36 84199. 31 1 64.66 6.866 1.426 1.666 1.426 228.65 369. 36 84199. 31 1 64.66 6.866 1.426 1.666 1.426 228.65 369. 36 84199. 31 1 64.66 6.866 1.426 1.666 1.426 228.65 369. 36 84199. 31 1 64.66 6.866 1.426 1.666 1.426 228.65 369. 36 84199. 31 1 64.66 6.866 1.426 1.666 1.426 228.65 369. 36 84199. 31 1 64.66 6.866 1.426 1.666 1.426 228.65 369. 36 84199.		29	i	63.20	9.866	1.339	1.666					
3N		3	1	63.69	ø.808	1.420	1.696	1.420	228.05	381.	35	86893.
74E			i	63.66	9.869	1.339	1.666	1.336	202.05	334.		65871.
14         1         63.60         8.800         1.330         1.800         1.330         269.66         334.38         66871.           2E         1         63.60         9.800         1.330         1.000         1.330         200.65         334.38         66871.           2W         1         63.60         0.800         1.330         1.000         1.330         200.66         334.38         66871.           3         1         63.00         0.800         1.330         1.000         1.330         200.66         334.38         66971.           3X         1         63.00         0.800         1.300         1.000         1.330         200.66         334.38         66971.           3X         1         63.00         0.800         1.500         1.500         1.500         254.47         425.34         162193.           3X         1         63.00         0.800         1.420         1.600         1.500         254.47         425.34         162193.           452         1         63.00         0.800         1.420         1.600         1.420         228.05         381.35         26893.           2E         1         63.00 <td< td=""><td></td><td>35</td><td>1</td><td>63.22</td><td>9.899</td><td>1.420</td><td>1.666</td><td>1.429</td><td>228.05</td><td>381.</td><td>35</td><td>368<b>73.</b></td></td<>		35	1	63.22	9.899	1.420	1.666	1.429	228.05	381.	35	368 <b>73.</b>
14         1         63.60         8.800         1.330         1.800         1.330         269.66         334.38         66871.           2E         1         63.60         9.800         1.330         1.000         1.330         200.65         334.38         66871.           2W         1         63.60         0.800         1.330         1.000         1.330         200.66         334.38         66871.           3         1         63.00         0.800         1.330         1.000         1.330         200.66         334.38         66971.           3X         1         63.00         0.800         1.300         1.000         1.330         200.66         334.38         66971.           3X         1         63.00         0.800         1.500         1.500         1.500         254.47         425.34         162193.           3X         1         63.00         0.800         1.420         1.600         1.500         254.47         425.34         162193.           452         1         63.00         0.800         1.420         1.600         1.420         228.05         381.35         26893.           2E         1         63.00 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>												
ZE         1         63.00         0.800         1.336         1.000         1.330         200.00         334.         38         66871.           ZW         1         63.00         0.800         1.330         1.000         1.330         200.00         334.         38         66371.           3         1         63.00         0.800         1.330         1.000         1.330         200.00         334.         38         66371.           33         1         63.00         0.800         1.500         1.500         1.330         200.00         334.         38         66371.           33         1         63.00         0.800         1.500         1.500         1.500         254.47         425.         34         100193.           75E         1E         1         63.00         0.800         1.420         1.900         1.420         228.05         381.         35         26893.           2E         1         63.00         0.800         1.420         1.900         1.420         228.05         381.         35         36893.           2E         1         63.00         0.800         1.500         1.600         1.420         228.05<	74E											
2W 1 63.88 6.888 1.338 1.888 1.338 268.66 334. 38 66871. 3 1 63.03 6.888 1.338 1.888 268.66 334. 38 66871. 3 1 63.03 6.888 1.338 1.888 268.66 334. 38 66871. 3 1 63.03 6.888 1.338 1.888 268.66 334. 38 66871. 3 1 63.08 6.888 1.588 1.888 265.66 334. 38 66871. 3 1 63.08 6.888 1.588 1.888 254.47 425. 34 183193.  75E 1E 1 63.68 6.888 1.588 1.588 1.588 254.47 425. 34 183193.  2E 1 63.88 6.888 1.428 1.888 1.428 228.85 381. 35 86893. 2E 1 63.88 6.888 1.678 1.688 1.678 315.42 527. 38 166226. 3 1 63.68 6.888 1.678 1.688 1.678 315.42 527. 38 166226. 3 1 63.88 6.888 1.428 1.888 1.538 282.34 472. 32 133187. 3N 1 63.88 6.888 1.428 1.888 1.538 282.34 472. 32 133187. 3N 1 63.88 6.888 1.428 1.888 1.428 228.85 381. 35 86893. 3S 1 63.88 6.888 1.428 1.888 1.428 228.85 381. 35 86893.  75E 1E 1 64.88 6.888 1.428 1.888 1.428 228.85 381. 35 86893.  3S 1 63.88 6.888 1.428 1.888 1.428 228.85 381. 35 86893.  3S 1 64.88 6.888 1.428 1.888 1.428 228.85 381. 35 86893.  3S 1 64.88 6.888 1.428 1.888 1.428 228.85 381. 35 86893.  3S 1 64.88 6.888 1.428 1.888 1.438 288.65 389. 36 84199.  2E 1 64.88 6.888 1.428 1.888 1.338 288.65 389. 36 84199.  3S 1 64.88 6.888 1.438 1.888 1.338 288.65 389. 36 84199.  3S 1 64.88 6.888 1.428 1.888 1.338 288.65 389. 36 84199.  3S 1 64.88 6.888 1.428 1.888 1.338 288.65 389. 36 84199.  3S 1 64.88 6.888 1.428 1.888 1.338 288.65 389. 36 84199.  3S 1 64.88 6.888 1.428 1.888 1.338 288.65 389. 36 84199.  3S 1 64.88 6.888 1.428 1.888 1.338 288.65 389. 36 84199.  3S 1 64.88 6.888 1.428 1.888 1.338 288.65 389. 36 84199.  3S 1 64.88 6.888 1.428 1.888 1.388 228.85 369. 36 84199.  3S 1 64.88 6.888 1.428 1.888 1.428 228.85 369. 36 84199.  3S 1 64.88 6.888 1.428 1.888 1.428 228.85 369. 36 84199.  3S 1 64.88 6.888 1.428 1.888 1.428 228.85 369. 36 84199.  3S 1 64.88 6.888 1.428 1.888 1.428 228.85 369. 36 84199.  3S 1 64.88 6.888 1.428 1.888 1.428 228.85 369. 36 84199.			1	63 <b>.60</b>	ହିତ୍ତି. ହି							
3 1 63.03 0.800 1.330 1.000 1.330 200.06 334. 38 66071. 38 1 63.00 0.800 1.500 1.000 1.500 254.47 425. 34 100193.  75E 1E 1 63.00 0.800 1.500 1.000 1.500 254.47 425. 34 100193.  75E 1E 1 63.00 0.800 1.420 1.000 1.420 228.05 301. 35 86893. 2E 1 63.00 0.800 1.420 1.420 1.420 228.05 381. 35 86893. 2E 1 63.00 0.800 1.570 1.670 1.570 315.42 577. 30 166226. 3 1 63.00 0.800 1.570 1.000 1.420 228.05 381. 35 86893. 38 1 63.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893. 38 1 63.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893. 38 1 63.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893. 38 1 63.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893. 38 1 63.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893. 39 1 63.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893. 39 1 63.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893. 30 1 63.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893. 30 1 63.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893. 31 63.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893. 31 63.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 22 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 31 64.00 0.800 1.300 1.000 1.300 200.06 324. 38 64798. 31 64.00 0.800 1.300 1.000 1.300 200.06 324. 38 64798. 31 64.00 0.800 1.500 1.000 1.300 200.06 324. 38 64798. 31 64.00 0.800 1.300 1.000 1.300 200.06 324. 38 64798. 32 1 64.00 0.800 1.300 1.000 1.300 200.06 324. 38 64799. 32 1 64.00 0.800 1.300 1.000 1.300 200.06 324. 38 64799. 33 1 64.00 0.800 1.420 1.000 1.320 200.06 324. 36 84199. 34 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 35 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 36 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 38 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 39 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 30 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 30 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 31 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.												
1			1	63.66								
75E 1E 1 63.00 6.800 1.500 1.000 1.500 254.47 425. 34 102193.  75E 1E 1 63.00 0.800 1.420 1.000 1.500 254.47 425. 34 102193.  1M 1 63.00 0.800 1.420 1.000 1.420 220.05 381. 35 36893.  2E 1 63.00 0.800 1.420 1.000 1.420 220.05 381. 35 36893.  2M 1 63.00 0.800 1.670 1.000 1.420 220.05 381. 35 36893.  2M 1 63.00 0.800 1.670 1.000 1.670 315.42 527. 30 166226.  3 1 63.00 0.800 1.670 1.000 1.530 282.34 472. 32 133187.  3M 1 63.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893.  3S 1 63.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893.  3S 1 63.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893.  76E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 381. 35 86893.  2E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  2E 1 64.00 0.800 1.330 1.000 1.420 228.05 369. 36 84199.  3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  4 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  4 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  4 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  4 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  4 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  4 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  4 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  4 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  4 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  4 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  4 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  4 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.												
75E 1E 1 63.88			1									
1W         1         65.00         0.000         1.420         1.900         1.420         228.05         381.35         3693.           2E         1         63.00         0.000         1.420         1.900         1.420         228.05         381.35         36893.           1W         1         63.00         0.000         1.670         1.900         1.670         315.42         527.35         166226.           3         1         63.00         0.000         1.530         1.000         1.530         282.34         472.22         133137.           3H         1         63.00         0.000         1.420         1.000         1.420         228.05         381.35         66893.           3S         1         63.00         0.000         1.420         1.000         1.420         228.05         381.35         66893.           75E         1E         1         64.00         0.000         1.420         1.000         1.420         228.05         381.35         64798.           1W         1         64.00         0.000         1.420         1.000         1.420         228.05         369.36         84199.           2W         1         64.		33	i	63.66	ହି. ଚିତ୍ରି	1.500	i.999	1.500	254.47	425.	34	198193.
1W         1         65.00         0.000         1.420         1.900         1.420         228.05         381.35         3693.           2E         1         63.00         0.000         1.420         1.900         1.420         228.05         381.35         36893.           1W         1         63.00         0.000         1.670         1.900         1.670         315.42         527.35         166226.           3         1         63.00         0.000         1.530         1.000         1.530         282.34         472.22         133137.           3H         1         63.00         0.000         1.420         1.000         1.420         228.05         381.35         66893.           3S         1         63.00         0.000         1.420         1.000         1.420         228.05         381.35         66893.           75E         1E         1         64.00         0.000         1.420         1.000         1.420         228.05         381.35         64798.           1W         1         64.00         0.000         1.420         1.000         1.420         228.05         369.36         84199.           2W         1         64.									051 17	• • • •	٠.	400104
2E       1       63.98       9.899       1.428       1.990       1.420       228.95       381.35       96893.         2W       1       63.99       9.898       1.678       1.899       1.676       315.42       527.35       166226.         3       1       63.99       0.899       1.530       1.530       282.34       472.22       133137.         3H       1       63.99       0.899       1.429       1.999       1.420       228.95       381.35       66893.         3S       1       63.99       0.899       1.420       1.899       1.420       228.95       381.35       66893.         75E       1E       1       64.99       0.899       1.420       1.899       1.420       228.95       331.35       66893.         75E       1E       1       64.99       0.899       1.420       1.899       1.420       228.95       369.36       64798.         1W       1       64.99       0.899       1.420       1.899       1.420       228.95       359.36       84199.         2W       1       64.99       0.899       1.599       1.530       222.34       457.32       129957.	755											
18 1 63.99 8.898 1.678 1.808 1.676 315.42 527. 35 166226. 3 1 63.09 8.808 1.580 1.808 1.530 282.34 472. 22 133187. 3N 1 63.00 6.800 1.428 1.800 1.420 228.85 381. 35 86893. 3S 1 63.00 6.800 1.420 1.800 1.420 228.85 381. 35 66893.  76E IE 1 64.00 8.800 1.420 1.800 1.420 228.85 381. 35 66893.  18 1 64.00 6.800 1.420 1.800 1.420 228.85 381. 35 66893.  76E IE 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199. 2E 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199. 2W 1 64.00 6.800 1.330 1.800 1.420 228.85 369. 36 84199. 3 1 64.00 6.800 1.580 1.800 1.580 222.34 457. 32 129857. 3N 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199.  77E IE 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199.  77E IE 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199.  77E IE 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199.  77E IE 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199.  77E IE 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199.  77E IE 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199.  77E IE 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199.  77E IE 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199.  78 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199.  78 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199.  78 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199.  78 1 64.00 6.800 1.420 1.800 1.420 228.85 369. 36 84199.		14										
3 1 63.98 0.890 1.580 1.000 1.420 228.85 381. 35 86893. 38 1 63.90 0.800 1.420 1.000 1.420 228.85 381. 35 86893. 38 1 63.00 0.800 1.420 1.000 1.420 228.85 381. 35 56893.   75E 1E 1 64.00 0.800 1.420 1.000 1.420 228.85 381. 35 56893.   1 64.00 0.800 1.420 1.000 1.420 228.85 381. 35 86199.   2E 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   2E 1 64.00 0.800 1.330 1.000 1.420 228.85 369. 36 84199.   3 1 64.00 0.800 1.500 1.300 1.300 200.06 324. 38 64798.   3 1 64.00 0.800 1.500 1.000 1.420 228.85 369. 36 84199.   3 1 64.00 0.800 1.500 1.000 1.420 228.85 369. 36 84199.   77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   3 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   4 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   4 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   4 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   4 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   4 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   4 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   4 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.00 0.800 1.420 1.000 1.420 228.85 369. 36 84199.   5 1 64.0												
3H 1 63.98 0.800 1.420 1.000 1.420 228.85 381. 35 86893.  75E 1E 1 64.00 0.800 1.420 1.000 1.420 228.85 381. 35 56893.  75E 1E 1 64.00 0.800 1.420 1.000 1.420 228.85 381. 35 56893.  75E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 389. 38 84199.  2E 1 64.00 0.800 1.420 1.000 1.420 228.05 389. 38 84199.  2H 1 64.00 0.800 1.500 1.300 1.420 228.05 389. 38 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 38 84199.  77E 1E 1 64.00 0.800 1.500 1.420 228.05 369. 38 84199.  77E 1E 1 64.00 0.800 1.500 1.000 1.420 228.05 389. 38 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 389. 38 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 389. 38 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 389. 38 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 389. 38 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 389. 38 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 389. 38 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 389. 38 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 389. 38 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 389. 38 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 38 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 38 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 38 84199.												
38 1 64.00 0.800 1.420 1.000 1.420 228.05 331. 35 36893.  76E 1E 1 64.00 0.800 1.420 1.000 1.330 200.06 324. 38 64798.  1W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  2E 1 64.00 0.800 1.420 1.000 1.330 200.06 324. 33 64793.  3 1 64.00 0.800 1.500 1.500 1.500 282.34 457. 32 129057.  3N 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  28 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.330 200.06 324. 38 64793.  1W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.320 200.06 324. 38 64793.  2B 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.												
76E 1E 1 64.00 0.800 1.330 1.000 1.330 200.06 324. 38 64798. 1W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 2E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84197. 2W 1 64.00 0.800 1.330 1.000 1.330 200.06 324. 33 64793. 3 1 64.00 0.800 1.500 1.500 1.500 202.34 457. 32 129057. 3W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 35 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  77E 1E 1 64.00 0.800 1.330 1.000 1.330 200.06 324. 38 64793. 1W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  2W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.												
1W         1         64.86         6.86         1.426         1.000         1.420         228.65         369         36         84199           2E         1         64.80         6.86         1.420         1.86         1.420         228.65         369         36         84197           2W         1         64.60         6.86         1.330         1.800         1.330         200.66         324         33         64798           3         1         64.60         9.860         1.580         1.200         1.580         227.34         457         32         129057           3N         1         64.60         9.860         1.420         1.600         1.420         228.65         369         36         84199           33         1         64.60         9.860         1.420         1.600         1.420         228.65         369         36         84199           33         1         64.60         9.860         1.500         1.420         228.65         369         36         84199           77E         1E         1         64.60         9.860         1.500         1.500         1.500         254.47         412         36<		35	1	63.66	9.899	1.429	1.000	1.420	779.80	331.	30	56873.
1W         1         64.86         6.86         1.426         1.000         1.420         228.65         369         36         84199           2E         1         64.80         6.86         1.420         1.86         1.420         228.65         369         36         84197           2W         1         64.60         6.86         1.330         1.800         1.330         200.66         324         33         64798           3         1         64.60         9.860         1.580         1.200         1.580         227.34         457         32         129057           3N         1         64.60         9.860         1.420         1.600         1.420         228.65         369         36         84199           30         1         64.60         9.860         1.420         1.600         1.420         228.65         369         36         84199           31         64.60         9.860         1.330         1.800         1.330         228.65         369         36         84199           324         34         64.60         9.860         1.500         1.420         228.65         369         36         84199	715	10	;	44 63	g ogg	1 228	1 222	1 222	288 81	274	22	26744
2E       1       64.88       6.884       1.426       1.886       1.426       228.85       369.       36       84197.         2W       1       64.86       6.868       1.338       1.806       1.338       228.85       324.       33       64798.         3       1       64.86       9.866       1.588       1.906       1.588       227.34       457.       32       129857.         3N       1       64.86       6.866       1.426       1.606       1.426       228.85       369.       36       84179.         35       1       64.66       6.866       1.426       1.806       1.426       228.85       369.       36       84199.         77E       1E       1       64.66       6.866       1.566       1.806       1.336       286.86       324.       38       64798.         1W       1       64.66       6.866       1.566       1.866       1.569       254.47       412.       34       164838.         2E       1       64.66       6.866       1.426       1.666       1.426       228.85       369.       36       84199.         2W       1       64.66       6.866	7 32											
2W 1 64.60 6.800 1.330 1.000 1.330 200.06 324. 33 64798. 3 1 64.00 9.800 1.580 1.200 1.580 202.34 457. 32 129057. 3N 1 64.00 9.800 1.420 1.000 1.420 228.05 369. 36 84199. 35 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  77E IE 1 64.00 0.800 1.330 1.000 1.330 200.06 324. 38 64798. 1W 1 64.00 0.800 1.500 1.000 1.500 254.47 412. 34 104838. 2E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 2W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.												
3 1 64.88 9.880 1.588 1.800 1.580 282.34 457. 32 129857. 3N 1 64.80 0.808 1.420 1.800 1.420 228.85 369. 36 84199. 35 1 64.80 0.800 1.420 1.800 1.420 228.85 369. 36 84199.  77E IE 1 64.80 0.800 1.330 1.800 1.330 280.86 324. 38 64798. 1W 1 64.80 8.800 1.580 1.800 1.590 254.47 412. 34 184838. 2E 1 64.80 0.800 1.420 1.800 1.420 228.85 369. 36 84199. 2W 1 64.80 6.800 1.420 1.800 1.420 228.85 369. 36 84199. 3 1 64.80 6.800 1.420 1.800 1.420 228.85 369. 36 84199. 3 1 64.80 8.800 1.420 1.800 1.420 228.85 369. 36 84199. 3 1 64.80 8.800 1.420 1.800 1.420 228.85 369. 36 84199.												
77E 1E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  77E 1E 1 64.00 0.800 1.500 1.000 1.330 200.06 324. 36 64799.  1W 1 64.00 0.800 1.500 1.000 1.500 254.47 412. 34 104338.  2E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  2W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  3W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  3W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.  3W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.												
77E 1E 1 64.00 0.000 1.300 1.000 1.420 228.05 369. 36 84199.  1W 1 64.00 0.000 1.500 1.000 1.500 254.47 412. 34 104038.  2E 1 64.00 0.000 1.420 1.000 1.420 228.05 369. 36 84199.  2W 1 64.00 0.000 1.420 1.000 1.420 228.05 369. 36 84199.  3W 1 64.00 0.000 1.420 1.000 1.420 228.05 369. 36 84199.  3W 1 64.00 0.000 1.420 1.000 1.420 228.05 369. 36 84199.  3W 1 64.00 0.000 1.420 1.000 1.420 228.05 369. 36 84199.												
77E 1E 1 64.00 0.009 1.330 1.000 1.330 200.05 324. 36 64799. 1W 1 64.00 0.800 1.500 1.000 1.500 254.47 412. 34 104038. 2E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 2W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3N 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.												
1W 1 64.00 0.800 1.500 1.900 1.500 254.47 412. 34 104838. 2E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 2W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3N 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.		20	1	07.12	D.Ord	1.72	1.000	1.745	LLU.UJ	307.	50	V74/14
1W 1 64.00 0.800 1.500 1.900 1.500 254.47 412. 34 104838. 2E 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 2W 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199. 3N 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.	77E	ΙE	1	64.66	6.869	1.336	1.666	1.338	200.05	324.	38	64799.
2E 1 64.66 0.869 1.429 1.600 1.420 228.85 369. 36 84199. 2W 1 64.60 6.860 1.420 1.600 1.420 228.65 369. 36 84199. 3 1 64.66 0.800 1.420 1.600 1.420 228.85 369. 36 84199. 3N 1 64.66 0.800 1.420 1.600 1.420 228.85 369. 36 84199.												
2W 1 64.66 6.200 1.426 1.600 1.420 228.65 369. 36 84199. 3 1 64.66 0.800 1.420 1.000 1.420 228.65 369. 36 84199. 3N 1 64.66 0.800 1.426 1.006 1.426 228.65 369. 36 84199.												
3 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84197. 3N 1 64.00 0.800 1.420 1.000 1.420 228.05 369. 36 84199.												
3N 1 64.99 0.809 1.420 1.000 1.420 228.85 369. 36 84199.												
		33	i	64.63	6.869	1.500	1.668				34	154838.

### A.A ENVIRONMENTAL DATA

The facility is located on the eastern shore of Hood Canal on the Kitsap Peneinsula (See Figures 1 - 3). The region is a long, north-south lowland situated between mountain ranges on the east and west. The region's ecology is characterized by dense conifer forests.

The topography of Bangor Annes is predominantly flat to gently rolling. Hills and valleys on site are irregular but have a general north-south trend. Three major streams and numerous minor drainages run through the site towards Hood Canal to the west.

The Hood Canal shore of the Bangor Annex is for the most part erosional, with steep wave cut slopes rising to more than 100 feet above sea level. The seashore environment is characterized by a slow erosion of the cliff and deposition of erosional debris (silts and sands) from the streams to offshore deltas.

The sea bottom slopes uniformly down toward the Hood Canal in a slope of about one in 10. Soils data indicates a major portion of the Bangor Annex is covered with a glacial tili of a dense gravel-sand-silt mixture. This relatively impermiable material varies in thickness from zero to more than 40 feet, with the thickest layer being in the southern portion of the site. Much of the till is covered by a relatively thin layer (10 feet) of medium dense sand and gravel with some areas of surface soils and gravel deposits.

Offshore, along the Bangor shoreline, the sea floor is covered with recent loose to medium dense granular materials at varying depths. At some locations, a wedge of till follows, thickening towards the center of the Canal. These sloping soils overlie and truncate a series of essentially horizontal sand silt strata. In the offshore areas, artesian conditions occur in areas where these silt strata exist. Offshore soil conditions were found to be generally good for offshore construction. Exceptions to this were found in areas where less suitable soil artesian conditions and till deposits occur and may

require some remedial preparation for emplacement of waterfront facilities.

Climatic conditions of Bangor Annex are representative of the Kitsap Peninsula, with short, cool, dry summers and mild, wet winters.

Annual precipitation varies from 30 to 70 inches with 75 to 80 percent of the annual rainfall occurring from October to March. The Kitsap Peninsula and Hood Canal are susceptible to slightly higher winds than other areas of the Puget Sound lowlands. The strongest winds are from the south and southwest and usually occur when intense Pacific storms move inland.

### Precipitation Averages:

Keyport - 30.66 inches annual rainfall
Premerton - 38.66 inches annual rainfall
Seattle - 34.10 inches annual rainfall
Quilcene - 50.90 inches annual rainfall

### Tidal range at the site is:

Extreme High Water (EHW) - +14.6 feet

Mean Higher High Water (MHHW) - +10.9 feet

Mean Tide Level (MTL) - + 6.4 feet

Mean Lower Low Water (MLLW) - 0.0 feet

Extreme Low Water (ELW) - - 4.5 feet

Elevations are based on Mean Lower Low Water which is 6.146 feet below Geodetic sea level datum of 1929 through the Pacific Northwest supplementary adjustment of 1947.

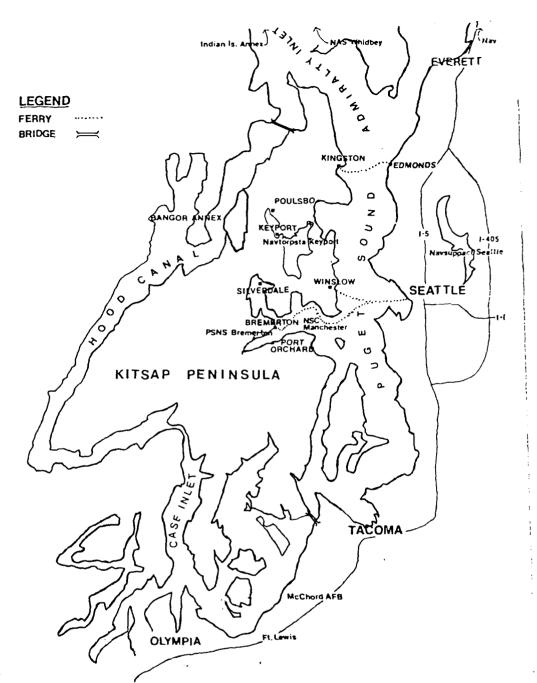
Wave forces at the site are based on an estimated significant wave height for 1 75 MPH wind velocity over a maximum fetch of 12 miles.

Earthquake criteria established for Seismic Probability Zone 3 in accordance with NAVFAC P-355 and Collapse Resistance Criteria for critical load structures in accordance with NAVFAC DM-2 Lateral Seismic Load Factors:

K = 1.0

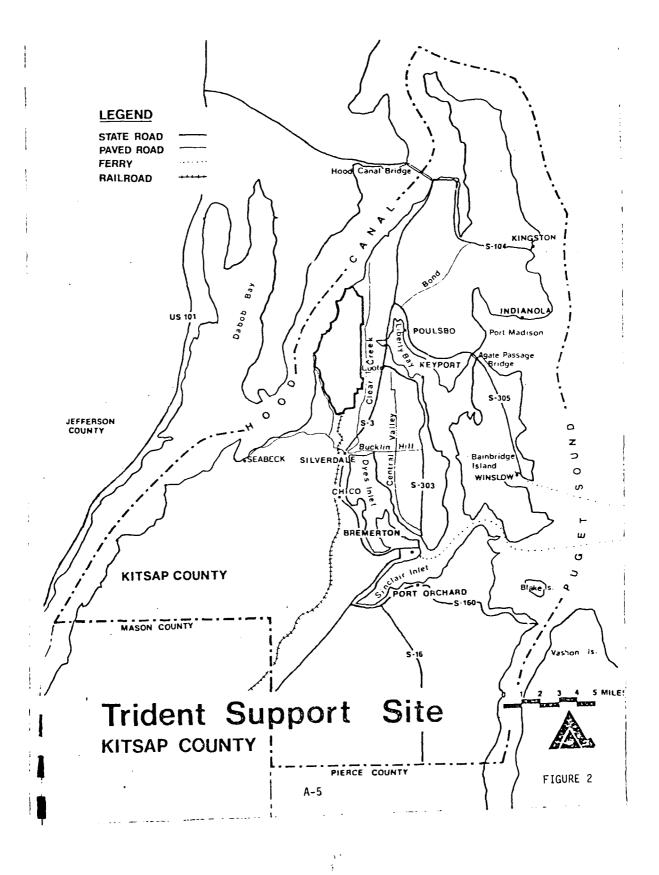
C = 0.05/T 1/3 for each structural element

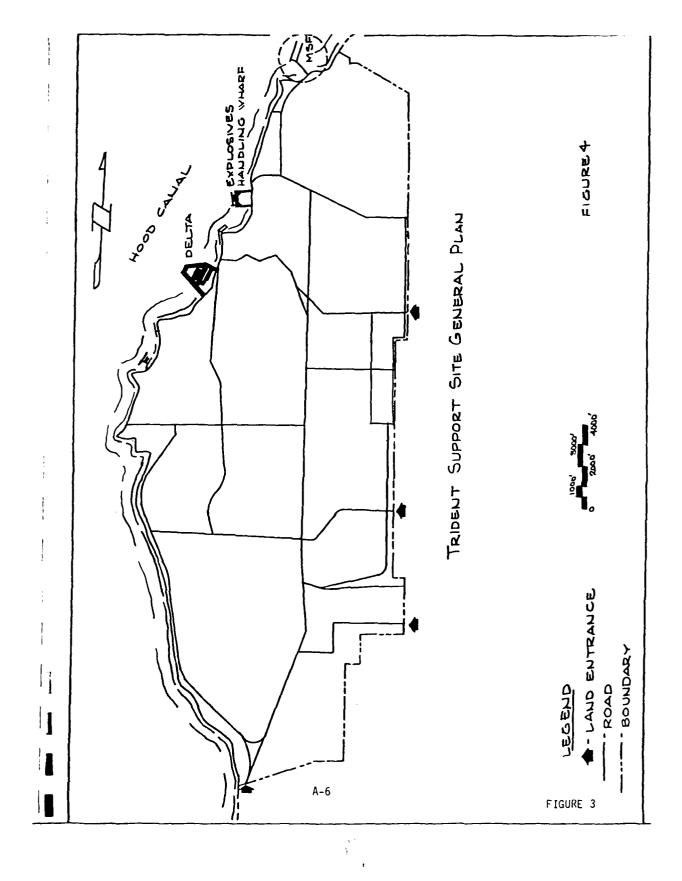
Z = 1.00



Trident Support Site PUGET SOUND · AREA

5 10 MI





### B.A INSPECTION PROCEDURE

### B.A.a Background on Instrumentation and Methods

The ULTRASCAN PTM-4 pile testing instruments are the results of studies initiated, at B.C. Research in 1955, to develop instruments for nondestructive testing of in-place marine piling. It was found that the velocity and strength of sound waves passing through wood varied inversely with voids in wood caused by marine borers. Based on this principle, instruments were developed which use magnetostrictive transducers to provide an ultrsaonic "scan" of the pile. The plane waves which penetrate the wood, from the transmitting transducer, initiate transmission of secondary sonic patterns in the direction of the wood grain. As these wave trains transmit along the axis of the pile they produce radial sets of waves which are picked up by the transducer. Undamaged wood is an excellent transmitter of these waves whereas damaged wood attenuates the sound. During the development stage, extensive axial load testing of pile sections was carried out and correlations were established between the sonic readings and the remaining undamaged cross-section of the pile. A direct meter readout is provided showing the precentage of sound wood remaining. Verification and refinement of the initial methods has been carried out by testing in-place piling, removing the piles and subjecting them to inspection and axial load testing. Good correlation was found between the sonic readings, the remaining undamaged area of the pile and the strength ratings based on the sonic instruments.

The testing crew consists of two men, a SCUBA diver who provides visual observations and scans the entire surface of the pile with the sonic "probe" (See Photograph No. 19), and a surface technician who monitors the observations and readings produced on the meter. (See Photograph No. 18). The probe is attached to the pile by the diver at the water surface. The diver then proceeds to scan the entire length of the pile from the surface to the mudline. The instruments provide a continuous cross-sectional area readout which is recorded by the surface technician. When the mudline is reached,

The probe is moved onto the adjacent pile in the bent and the process is repeated from the mudline to the surface. Removal of fouling is not required for operation of the unit. The pile "ratings" are given in terms of undamaged cross-sectional area remaining in each pile. These ratings are based on the least cross-sectional area found as revealed by sonic and visual data. The ratings are given in quartiles and indicate both the location and degree of loss of pile cross-section in damaged piles. Based on the data provided, the new L/d ratio of a pile can be established in light of damage found. This data, in turn, provides the basis for individual column analysis and overall structural analysis.

The ULTRASCAN is used to detect and assess marine borer and mechanical damage in the immersed areas of the pile from mudline to high tide level. Additional inspection is carried out from the high tide level to the cap to locate any possible mechanical or fungal damage.

## B.A.b Reasons for Selection of Particular Instrumentation and Methods

Bankia damage in piling can only be determined by underwater inspection, with many attendant difficulties. If the Bankia are alive and the siphons are extended, recognition is not too difficult. If the siphons are retracted or the Bankia are dead, detection of the burrow openings is not easy. In many instances, fouling must be scrubbed off the piling in order to facilitate an inspection. If visibility is limited, as frequently occurs in industrial locations, visual inspection is hopeless. Even if teredine entry holes are observed, an evaluation of internal damage, by purely visual means, is not possible. (See Photographs 20 and 21).

Because of these difficulties, the sonic testing method was initially developed to locate and evaluate teredine damage. It was felt that Limnoria damage could be readily detected visually, since the damage

progressed from the surface inward. Experience, however, has shown that the sonic testing method substantially enhances the detection and evaluation of damage even in areas where *Limmoria* is the primary source of infestation. Some of the reasons for this are as follows:

- In areas with poor or non-existent underwater visibility, sonic testing expedites the examination by locating the damage and providing a quantitative evaluation of the residual strength.
- 2. Limnoria attack very often takes the path of least resistance. That is, Limnoria will gain access into a pile through a small breach in the creosoted layer and destroy the untreated heartwood with very little surface evidence of damage. A good example of this is a U.S. Navy Fuel Dock. In this particular structure a considerable number of piles, which have been destroyed by Limnoria, show no obvious visual indication of damage. The reason for this is that the Limnoria has gained access to the pile through open boltholes. The boltholes are virtually impossible to detect unless all fouling is removed from the pile and a minute visual examination is carried out. This type of visual examination would be very time consuming and costly. It would be further restricted by poor underwater visibility.
- 3. Limnoria damage, particularly in Southern waters, very often exposes the treated pile to teredine attack which would be very difficult to detect and assess visually.

### B.B PERSONNEL ON PROJECT

Jerry Agi - Project Manager

Erling Vegsund - Project Supervisor

Scott Christie - Engineering Technician

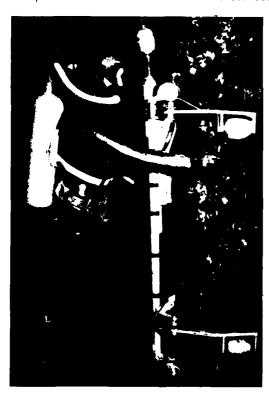
Fred Phillips - Drafting and Graphics

Maria Sjoquist - Report Preparation



PHOTOGRAPH No. 18

The surface unit monitored by technician. The meter provides a continuous cross-sectional area readout -- also two-way telephone contact between diver and surface.



PHOTOGRAPH No. 19

The ULTRASCAN PTM-4, the underwater sonic probe unit used to scan piles and locate internal damage. Probe is manipulated by diver.



PHOTOGRAPH No. 20

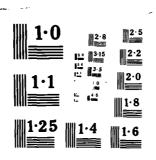
Creosote treated pile section with virtually no evidence of internal damage -- shows the difficulty of providing quantitative structural data visual inspection.



PHOTOGRAPH No. 21

Same pile cut to show extensive internal teredine damage.

AD-A168 674 2/2 UNCLASSIFIED



### B.C TIME OF PROJECT

The field inspection was carried out during the week of June 4, 1984.

### B.D. EXIT BRIEFING

At 1300 on 8 June, 1984, Mr. Philip Scola, Program Manager, Chesapeake Division Naval Facilities Engineering Command and Mr. Jerry Agi, Project Manager, J. Agi & Associates briefed personnel from Trident Refit Facility (TRF) on inspection findings. This was essentially an overview of the contents of Sections 4.3 and 4.4 of this report. It was emphasized that while inspecting the required bearing piles and cable troughs Bankia and Limnoria attack was observed on other timber members. These were the framing timbers which support the trough poles at the pier bearing piles, cut ends of wales and cross-bracing timbers, and other cable supports. A recommendation was made to inspect all these miscellaneous timber members and a ballpark of \$15,000.00 was estimated for that inspection. Attendees were as follows:

Tom Forstall, Department Manager, Idustrial Facilities Eng. TRF Code 200
Jim McPherson, Facility Manager, TRF Code 220
Dave Johnson, Engineering Technician, TRF Code 221
Roger Bushnell. Engineering Technician, TRF Code 222
Gene Grade, Magnetic Silencing Division Director, TRF Code 230
Rod Wigman, Engineer, TRF Code 231

# END DATE FILMED 7 - QC